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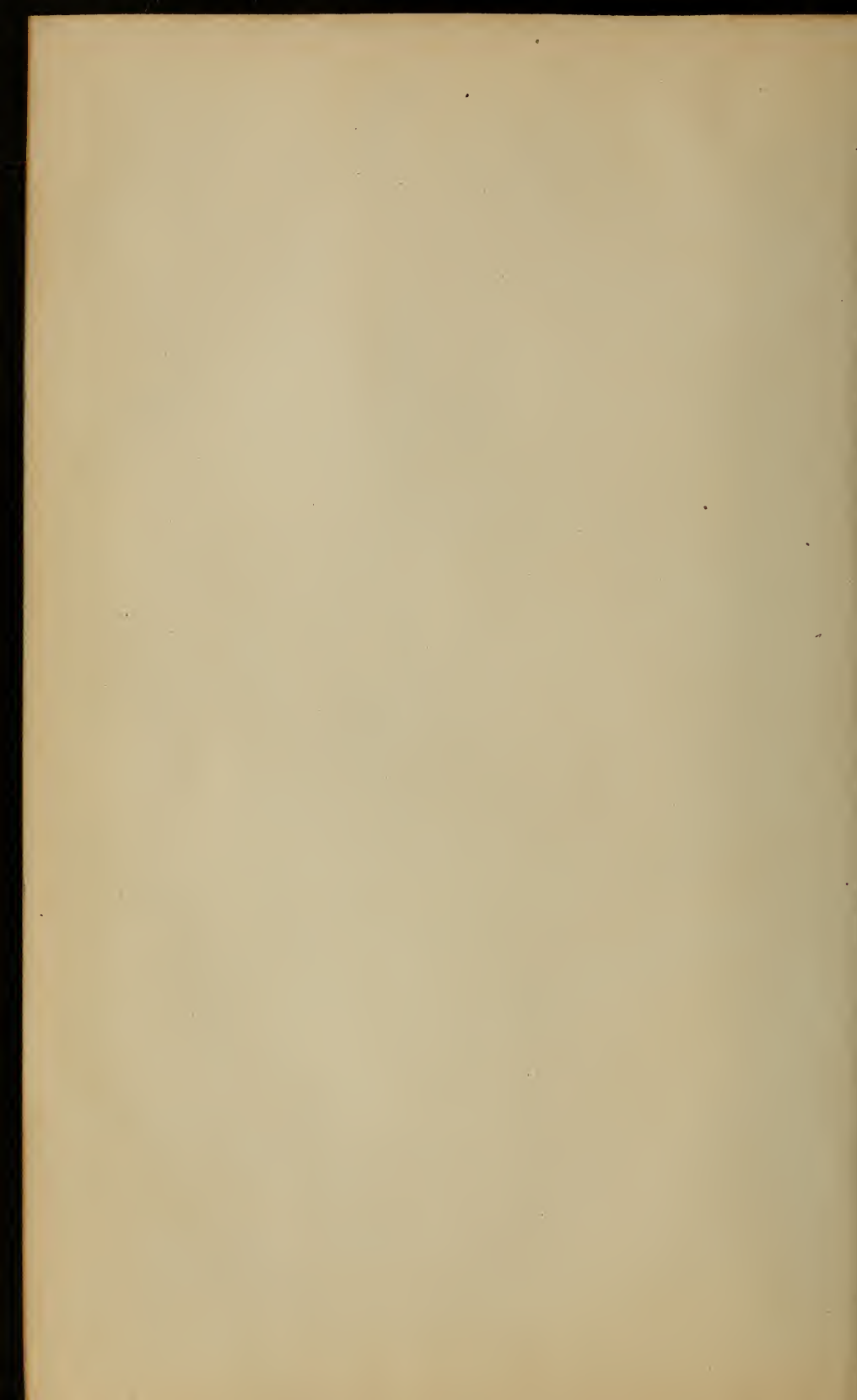
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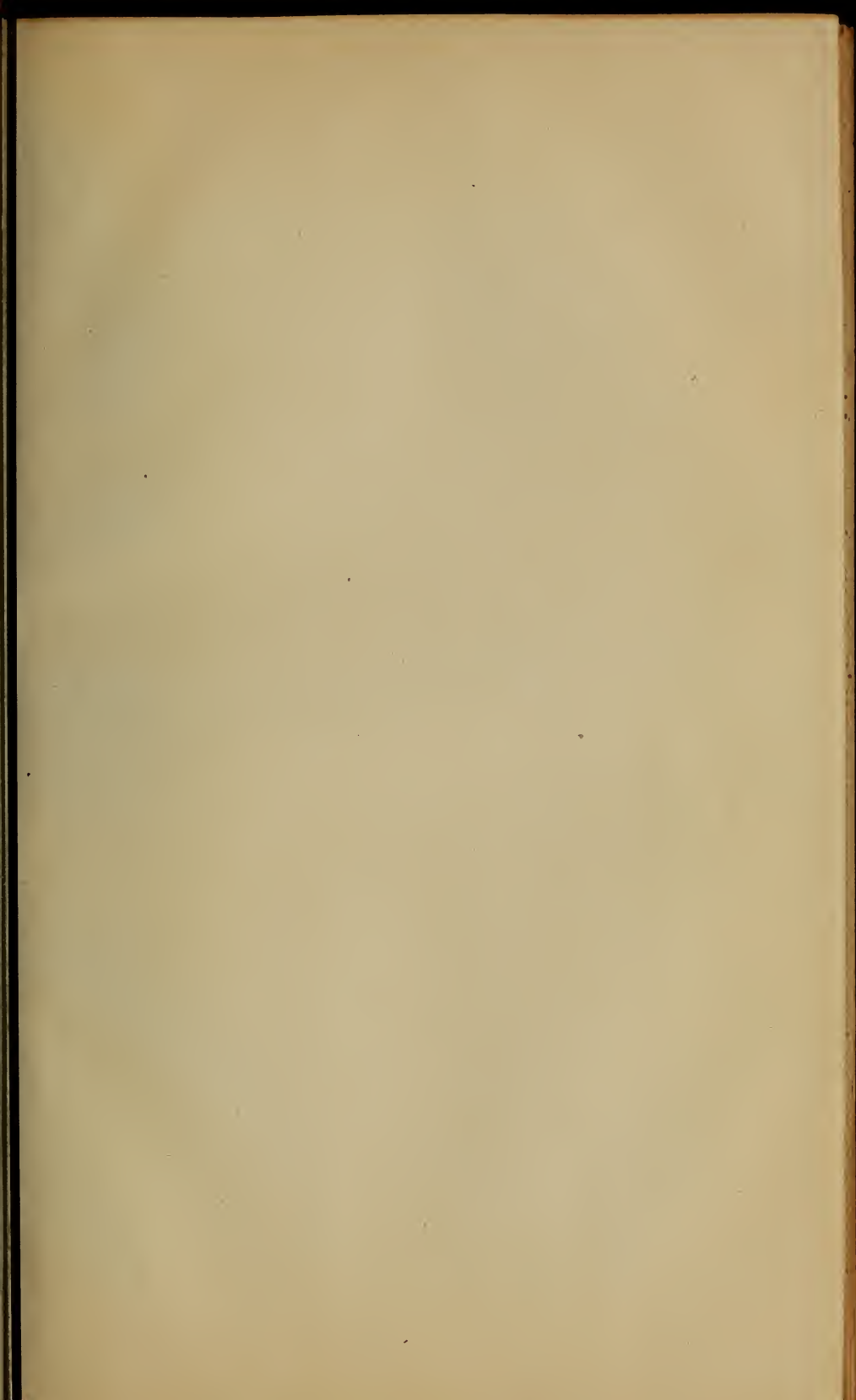
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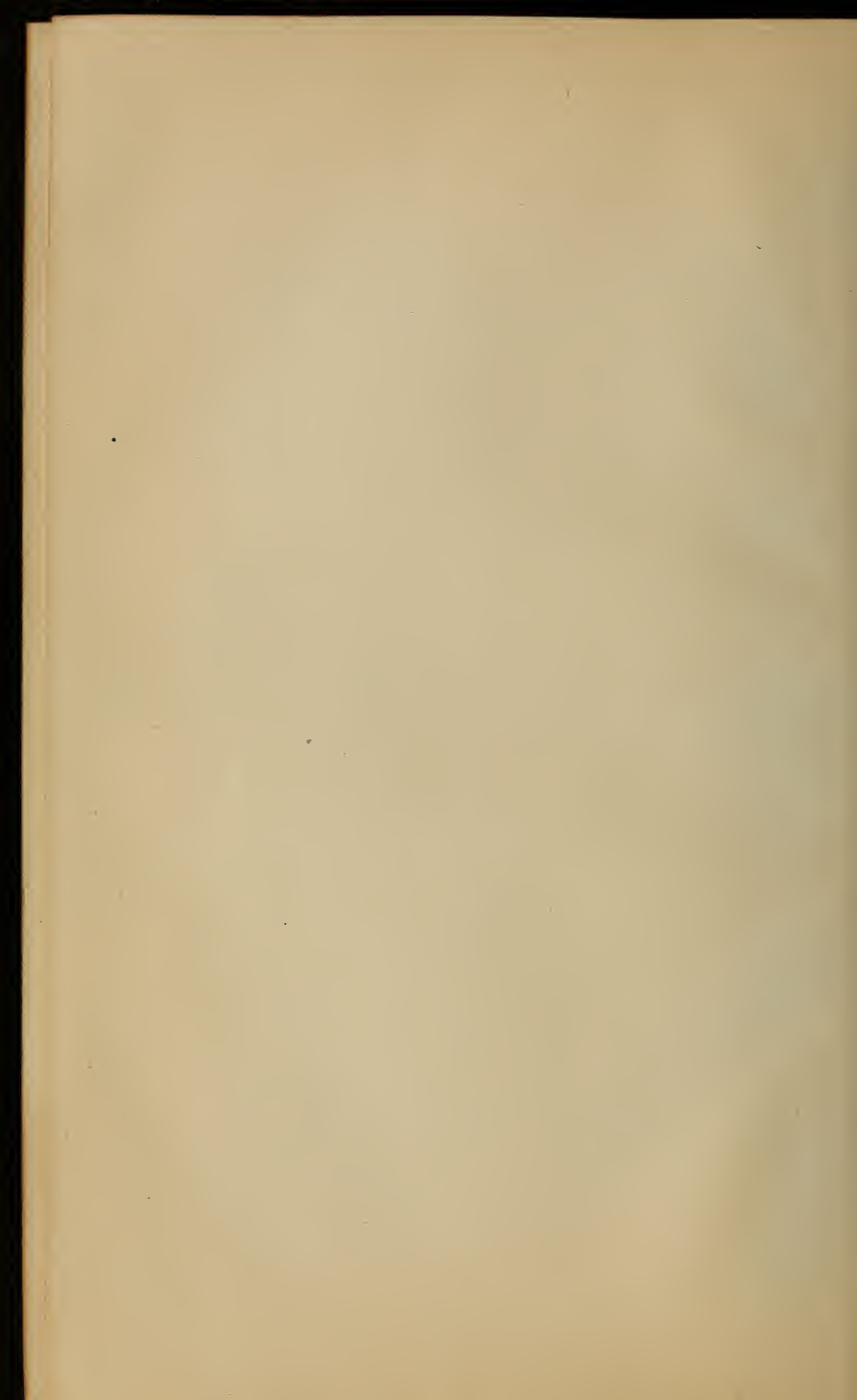




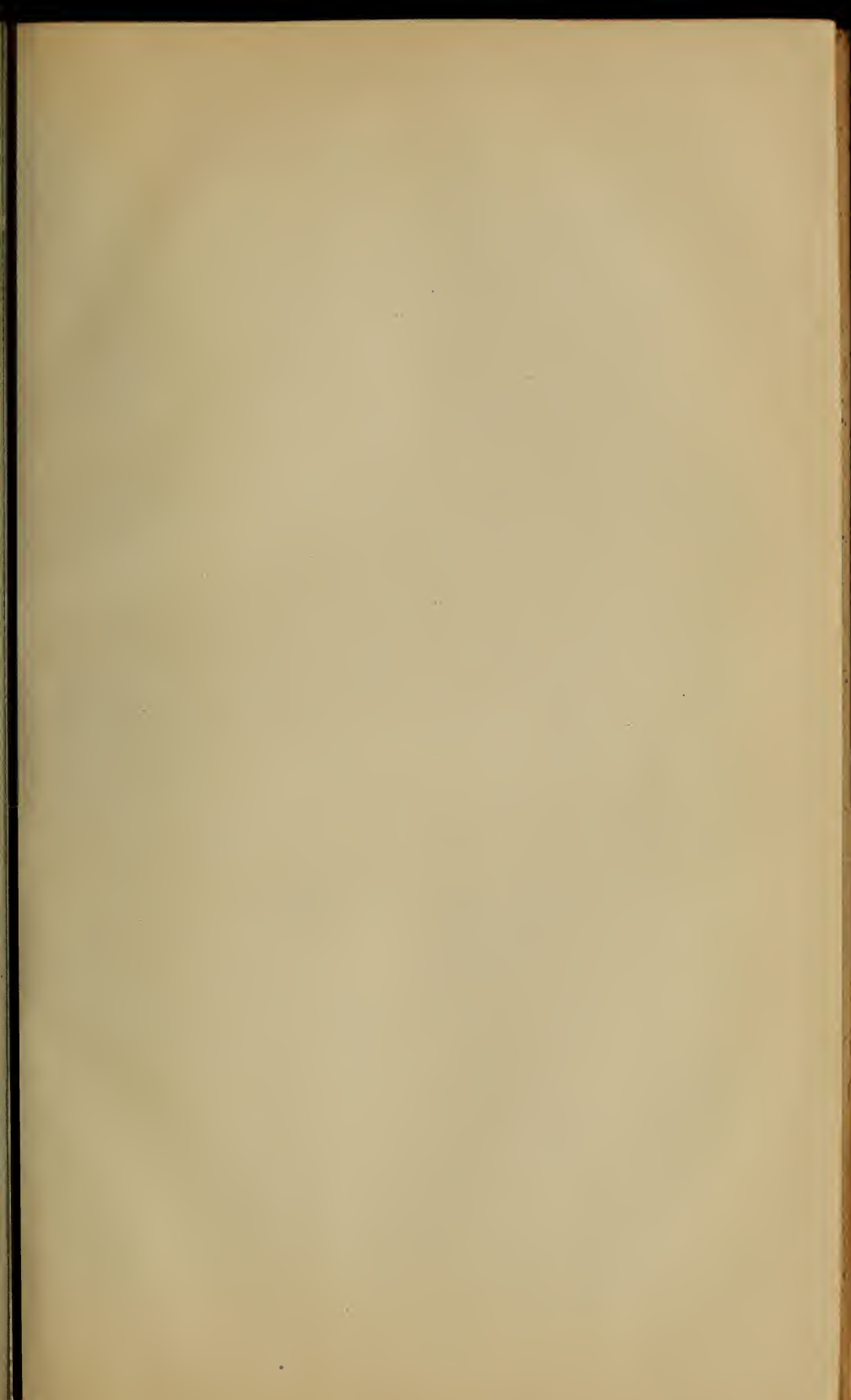


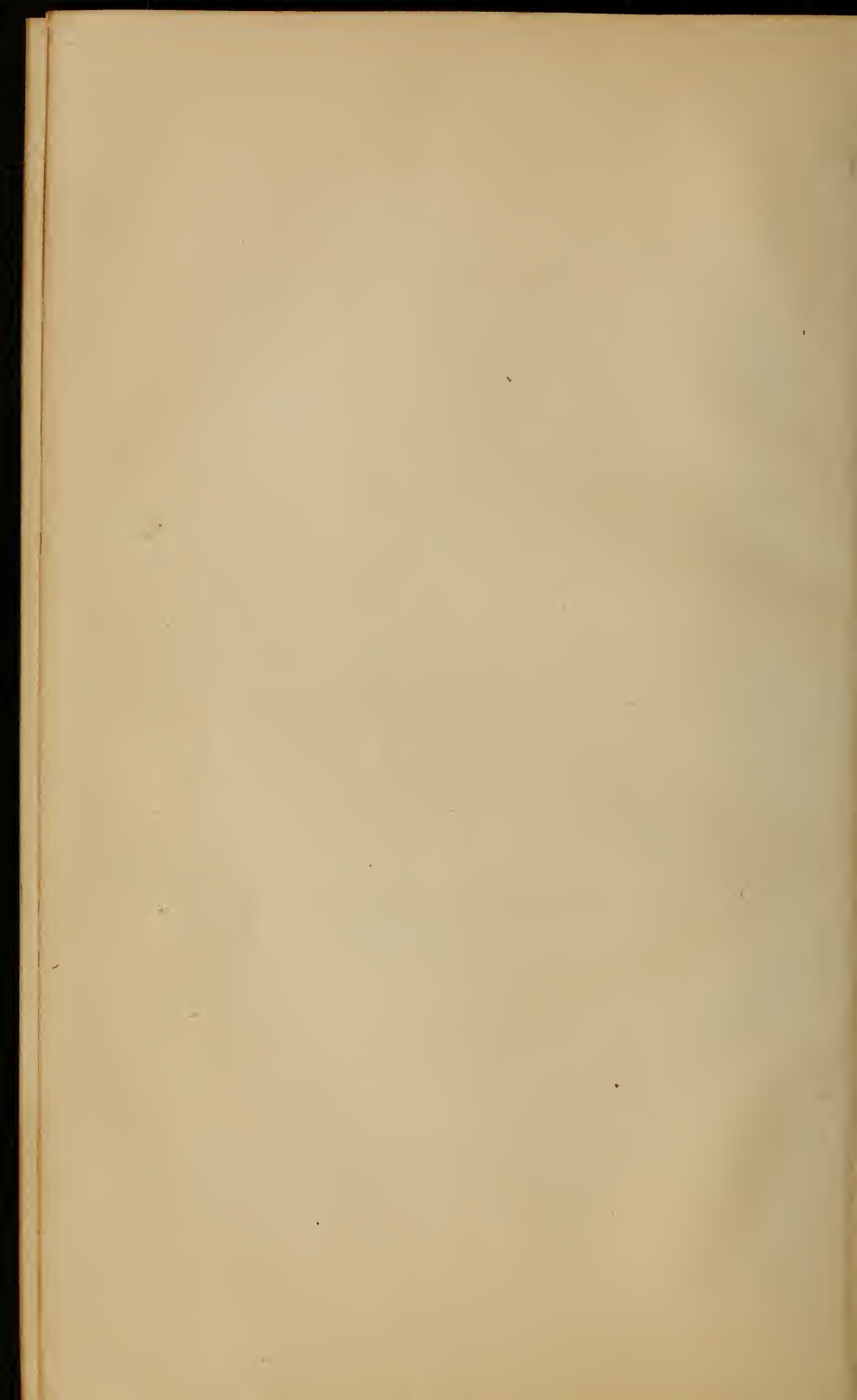














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PATHOLOGICAL AND SURGICAL

OBSERVATIONS

ON THE

DISEASES OF THE JOINTS.

BY B. C. BRODIE, V.P.R.S.

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THIRD EDITION, WITH ALTERATIONS AND ADDITIONS.



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## ADVERTISEMENT.

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THIS new edition of my Treatise on the Diseases of the Joints is not a mere republication of those which have preceded it. There are not more than two chapters which appear exactly in their former shape; and some of them are so altered, or have received such extensive additions, that they bear little resemblance to their originals. It has been my wish to add, to the materials which I had formerly collected, whatever information respecting these diseases I have since been able to acquire. But to accomplish this object has been a work of no small labor to one, whose time is occupied by a variety of other engagements: and I trust that what I have now mentioned will be deemed a sufficient apology for the circumstance of this volume having been announced to the public so long before it has actually appeared.

B. C. BRODIE.

*Saville Row, March 28, 1834.*

## CHAPTER I

The first part of the book is devoted to a general survey of the subject, and to a description of the various methods which have been employed for its investigation. The second part is devoted to a detailed account of the experiments which have been performed, and to a discussion of the results which have been obtained. The third part is devoted to a consideration of the various theories which have been proposed to explain the phenomena which have been observed, and to a comparison of these theories with the experimental results. The fourth part is devoted to a consideration of the various applications of the subject, and to a discussion of the various methods which have been employed for its investigation.

CHAPTER II



# CONTENTS.

---

INTRODUCTION	-	-	-	-	-	-	-	PAGE 1
--------------	---	---	---	---	---	---	---	-----------

## CHAP. I.

### ON INFLAMMATION OF THE SYNOVIAL MEMBRANES OF JOINTS.

SECT. I.—Pathological Observations	-	-	-	-	-	-	3
SECT. II.—On the Causes and Symptoms of this Disease	-	-	-	-	-	-	7
SECT. III.—On the Treatment	-	-	-	-	-	-	11
SECT. IV.—Cases	-	-	-	-	-	-	16

## CHAP. II.

ON ULCERATION OF THE SYNOVIAL MEMBRANE	-	-	-	-	-	25
----------------------------------------	---	---	---	---	---	----

## CHAP. III.

### ON CASES, IN WHICH THE SYNOVIAL MEMBRANE HAS UNDERGONE A MORBID CHANGE OF STRUCTURE.

SECT. I.—Pathological Observations	-	-	-	-	-	26
SECT. II.—On the Symptoms of this Disease	-	-	-	-	-	32
SECT. III.—On the Treatment	-	-	-	-	-	33

## CHAP. IV.

### ON THE ULCERATION OF THE ARTICULAR CARTILAGES.

SECT. I.—Pathological Observations	-	-	-	-	-	35
------------------------------------	---	---	---	---	---	----

	PAGE
SECT. II.—On the Symptoms of this Disease - - -	47
SECT. III.—On the Treatment - - - - -	53
SECT. IV.—Cases - - - - -	62

## CHAP. V.

## ON A SCROFULOUS DISEASE OF THE JOINTS, HAVING ITS ORIGIN IN THE CANCELLOUS STRUCTURE OF THE BONES.

SECT. I.—Pathological Observations - - - -	69
SECT. II.—On the Symptoms of this Disease - - -	74
SECT. III.—On the Treatment - - - - -	77
SECT. IV.—Cases - - - - -	81

## CHAP. VI.

## ON CARIES OF THE SPINE.

SECT. I.—Pathological Observations - - - -	87
SECT. II.—On the Symptoms of Caries of the Spine - - -	93
SECT. III.—On the Treatment - - - - -	99

## CHAP. VII.

## ON TUMORS AND LOOSE CARTILAGES IN THE CAVITIES OF THE JOINTS 103

## CHAP. VIII.

## ON MALIGNANT DISEASES OF THE JOINTS - - - - 107

## CHAP. IX.

## ON SOME OTHER DISEASES OF THE JOINTS - - - 111

## CHAP. X.

## ON INFLAMMATION OF THE BURSE MUCOSÆ.

SECT. I.—History and Symptoms of this Disease - -	121
---------------------------------------------------	-----

	PAGE
SECT. II.—On the Treatment	123
SECT. III.—Cases	124

---

## ADDITIONAL NOTES.

1. On Ulceration of the Articular Cartilages	126
2. On the Absorption of Cartilages complicated with the Effects of Friction on the Bones	131





## INTRODUCTION.

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THE following pages contain a series of observations, which were begun several years ago, and which have been continued, not without considerable labor, up to the present period. They relate to a class of diseases which have strong claims on the attention of the surgeon; since they are of very frequent occurrence; are a source of serious anxiety to the patients; and, for the most part, if neglected, proceed to an unfavorable termination. There are other circumstances, also, which seemed to render the morbid affections of the joints a fit subject of investigation. They have scarcely met with the attention which they merit from former pathologists. The terms, white swellings, scrophulous, joints, &c., have been used without any well-defined meaning, and almost indiscriminately; so that the same name has been frequently applied to different diseases, and the same disease has been distinguished by different appellations. Confusion with respect to diagnosis always gives rise to a corresponding confusion with respect to the employment of remedies; and hence I was induced to hope, that, if it were possible to improve our pathological knowledge of the diseases to which I have alluded, this might lead, not indeed to the discovery of new methods of treatment, but to a more judicious and scientific application of those which are already known, and a consequent improvement of chirurgical practice.

The joints, like the other animal organs, are not of a simple and uniform, but of a various and complicated structure. Although, in the advanced stages, the diseases, to which they are liable, extend to all the dissimilar parts of which they are composed, it is to be presumed that such is not the case in the beginning. We cannot doubt that here, as elsewhere, the morbid actions commence sometimes in one and sometimes in another texture; and that they differ in their nature, and are variously modified, and, of course, require to be differently treated, according to the mechanical organization, and the vital properties of the part, in which they originate.

It was under the influence of these impressions that I endeavored to pursue my inquiries into the subject of the present treatise. Believing that nothing has contributed in a greater degree towards the modern improvements in surgery, than the practice of investigating by dissection the changes of anatomical structure, which disease produces, I availed myself of every opportunity which occurred of making such examinations. In particular, I was anxious to do this where the morbid changes were still in an early stage, and where I had the opportunity of noting the symptoms by which the incipient disease was indicated; and the knowledge which was thus acquired became the basis of my future observations. In laying the results before the

public, I cannot be otherwise than conscious, that these researches are still imperfect. But I feel assured, at the same time, that those who are engaged in the study of pathology, will make due allowance for the difficulties which belong to this most complicated of all the sciences, and will not be disposed to criticise my labors severely, because they find that there is still an ample space left for those who may be willing to engage in similar inquiries.

Some of my readers will recognise in the present work the substance of three papers, which have been published in the fourth and two subsequent volumes in the *Medico-Chirurgical Transactions*; but they will also find a considerable proportion of new matter. I have met with no reasons for altering my former arrangement of those affections of the joints which are of most frequent occurrence. Indeed, it has been to me a source of much satisfaction, that all my subsequent observations, founded on numerous additional cases and dissections, have tended to confirm the accuracy of those pathological views which I was led to adopt several years ago, and which I ventured to bring forward in the first of those papers to which I have alluded.

## CHAPTER I.

### ON INFLAMMATION OF THE SYNOVIAL MEMBRANES OF JOINTS.

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#### SECTION I.

#### *Pathological Observations.*

THE soft parts, which, added to the bones and cartilages, constitute the structure of the joints, are, the synovial membranes, by which the lubricating fluid is secreted; the ligaments, by which the bones are connected to each other; and the fatty substance, which occupies what in certain positions would otherwise be empty spaces. It is to be supposed, that the adipose membrane belonging to the joints may be inflamed; that it may be the seat of abscesses and tumors, as well as that which is situated beneath the skin or in the interstices of the muscles; and the ligaments cannot be regarded as more exempt from disease than the fibrous membranes, which they very nearly resemble in their texture. It is not improbable that some of the pains which take place in the joints in syphilitic affections, may depend on a diseased action occurring in the ligaments; and there can be no doubt that the long continued symptoms, which occasionally follow a severe sprain, depend on these same parts being in a state of slow inflammation, in consequence of some of their fibres having been ruptured, or over-stretched. I cannot say that I have never seen a case where disease, independently of these causes, has originated in the ligaments; but I certainly have never met with a case where it has been proved to have done so by dissection; and it may be safely asserted, that this is a rare occurrence, and not what happens in the ordinary diseases to which the joints are liable.

On the other hand, no part of the body is much more frequently diseased than the synovial membranes. This is what their anatomical structure and functions might lead us to expect, since we find that living organs are more subject to have their natural functions deranged, in proportion as they are more vascular, and as they are employed in a greater degree in the process of secretion.

The synovial membranes of the joints have not been well described by the majority of the old, nor even of modern, anatomists. A sufficiently accurate account of them, however, has been published by Dr. W. Hunter, in a communication to the Royal Society on the structure of cartilage published in the forty-second volume of the Philosophical Transactions, and since then by M. Bichat, in his *Traite des Membranes*; and to these authors I may refer those of my readers who wish to see their anatomy more fully explained. At present, it is sufficient for me to observe, that the office of the synovial membrane of a joint is to secrete the synovia, by which the joint is lubricated; that it lines the ligaments, by which the bones are held



together; covers the bones themselves for a small extent, taking the place of the periosteum; and that from thence it passes over the cartilaginous surfaces, and the inter-articular fat. Where it adheres to the bones and soft parts, it very much resembles the peritonæum in its structure, and possesses considerable vascularity; but where it is reflected over the cartilages it is thin, and readily torn: its existence, however, even here, may be always distinctly demonstrated by a careful dissection. The synovial membrane of a joint forms a bag, having no external opening; in this respect resembling the peritonæum, the pleura, and the pericardium; which it also resembles in its functions, and to which it bears some analogy in its diseases.

Cases occasionally (but not often) occur, in which a joint is swollen from a preternatural quantity of fluid collected in its cavity, without pain or inflammation. This may be supposed to arise, either from a diminished action of the absorbents, or an increased action of the secreting vessels. The disease may be compared to the dropsy of the peritonæum or pleura; or, more properly, to the hydrocele; and it has been not improperly designated by the terms "*Hydarthrus*," and "*Hydrops articuli*."

It more frequently happens that there is swelling from fluid in a joint, with inflammation and pain. Here we may presume that the disease consists in an inflammation of the synovial membrane, with a consequent increase of the secretion from its surface; and I have found this confirmed by the appearances observed in many such cases, in which I had the opportunity of examining the affected parts after death.

In some instances, while there is still pain and inflammation in the joint, the fluid is felt indistinctly, as if a considerable mass of soft substance lay over it. Often, when the inflammation has subsided, and the fluid is no longer to be felt, the joint remains swollen and stiff; painful, when bent or extended beyond a certain point, and liable to a return of inflammation from slight causes. The appearances observed on dissection, in the following cases, seem to throw light on this subject.

CASE I.—A middle-aged man was admitted into St. George's Hospital, in September, 1810, on account of a disease in one knee. The joint was swollen and painful, with a slight stiffness, and with fluid in its cavity. The swelling extended some way up the anterior part of the thigh, behind the lower portion of the extensor muscles. It subsided under the use of blisters and liniments. Two months after his admission into the hospital, he was seized with a fever, apparently unconnected with the disease in the knee, of which he died. On examining the affected joint, the synovial membrane was found more capacious than natural, so that it extended up the anterior surface of the femur at least an inch and a half higher than under ordinary circumstances. Throughout the whole of its internal surface, except where it covered the cartilages, the membrane was of a dark red color; the vessels being as numerous, and as much distended with blood, as those of the tunica conjunctiva of the eye in a violent ophthalmia. At the upper and anterior part of the joint, a thin flake of coagulated lymph was effused from the inner surface of the synovial membrane, of the size of a half-crown piece. There was no other appearance of disease, except that at the edge of one of the condyles of the femur, the cartilage adhered to the bone less firmly than usual.

CASE II.—A. B., a young man, in the spring of the year 1808, in consequence (as he supposed) of exposure to damp and cold, became affected with a painful swelling of one of his knees. Under the treatment employed by the practitioner whom he consulted, the pain and swelling in great measure,



but not entirely, subsided. Three months after the disease first took place, he was admitted into St. George's Hospital. At this time the knee was swollen, painful, and tender. The swelling had the form of the articulating ends of the bones. The leg was confined to nearly the straight position, and admitted of very little motion on the thigh. His general health was unaffected.

Blood was taken from the knee by cupping; and afterwards it was rubbed daily with mercurial ointment and camphor. The pain and inflammation subsided; and the swelling and stiffness were in some measure lessened. It afterwards became necessary to amputate the limb on account of another disease. The operation was performed on the 15th of December, 1808, and I did not neglect the opportunity of examining the joint.

The bones, cartilages, and ligaments, were in a natural state. The synovial membrane was increased in thickness to about one-eighth of an inch, and was of gristly texture. It was closely attached to the surrounding cellular membrane and fascia by means of coagulated lymph, which had been formerly effused on its external surface.

CASE III.—A middle-aged man, who labored under an organic disease of the liver, was admitted into St. George's Hospital on the 19th of December, 1821, on account of a painful swelling of one knee. Blood was taken from the knee by cupping, and afterwards blisters were applied. The affection of the knee was much relieved under this treatment, but the joint remained rather larger than natural, and somewhat stiff. The disease in the liver continued to make progress, and the man died on the 11th February, 1822. On examining the body after death, the synovial membrane of the knee was found slightly thickened, and of a grissly structure. The vessels on its inner surface were more loaded with blood than under ordinary circumstances. The cartilage covering that portion of the articulating extremity of the femur which corresponds to the patella, in one spot of about three quarters of an inch in diameter, presented an irregular surface, as if it had been partially absorbed, but not to a sufficient extent to expose the surface of the bone below.

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These cases seem to explain the usual consequences of inflammation of the synovial membrane. It occasions, 1st, a preternatural secretion of synovia; 2dly, effusion of coagulated lymph into the cavity of the joint; 3dly, in other cases, a thickening of the membrane; a conversion of it into a gristly substance; and an effusion of coagulated lymph, and probably of serum, into the cellular texture, by which it is connected to the external parts.

I have seen several cases where, from the appearance of the joint, and other circumstances, there was every reason to believe that the inflammation had produced adhesions, more or less extensive, of the reflected folds of the membrane to each other; and I have observed occasionally, in dissection, such partial adhesion as might reasonably be supposed to have arisen from inflammation at some former period.

The slight adhesion of the cartilage to the bone, in the first of the cases which have been related, and the partial absorption of the cartilage in the last case, we must suppose to have been the consequence of the greater disease in the synovial membrane. In another case, in which the patient,

having recovered of inflammation of the synovial membrane, died several months afterwards of another disease, I found, on dissection, that the greater part of the cartilage of the patella, and a small portion of that covering the condyles of the femur, had disappeared, and that its place was occupied by a thin yellow membranous substance adhering to the bone, and forming a distinct cicatrix. I have known many cases in which there was extensive destruction of the cartilages of a joint by ulceration, manifestly arising from neglected inflammation of the synovial membrane. That this should happen, is no more remarkable than that ulcer of the cornea should occasionally be induced by inflammation of the *tunica conjunctiva* of the eye. At the same time, I believe it will be found, in the majority of cases, of caries of the joints, that the disease has begun in the harder textures, and that the inflammation of the synovial membrane by which it is accompanied, is a secondary affection, the consequence of the formation of an abscess in the articular cavity.

Inflammation of the synovial membrane occasionally terminates in suppuration, without having induced ulceration of either the soft or hard textures of the joints. I found this to have happened in the case of a patient who died in consequence of a small wound, which had penetrated into the elbow, the joint being full of pus, although there was no ulcerated surface. The same thing occasionally occurs where the inflammation has not had its origin in a mechanical injury.

There is a peculiar morbid state of the system, which, in some instances, follows severe accidents, or operations, and which is well known to surgeons who are engaged in the practice of the London Hospitals, in which the patients are liable to deposits of pus in various parts of the body, at a distance from the seat of the original injury. These deposits not unfrequently take place in the cavities of joints, as a consequence of inflammation of the synovial membrane, and independently of ulceration. Several examples of the kind have fallen under my own observation; but it will be sufficient for me to refer to those which have been recorded by the late Mr. Rose, and by Mr. Arnott, in the fifteenth volume of the *Medico-Chirurgical Transactions*.

In one of the cases related by Mr. Arnott, it is stated that the cavity of the knee-joint was filled with a "tolerably thick pus, of an uniformly reddish color, as if from an admixture of blood." The following case affords a still more remarkable example of the secretions of an inflamed synovial membrane being tinged in the same manner.

CASE IV.—Henry Payne, thirty-nine years of age, was admitted into St. George's Hospital, under the care of Mr. Hawkins, on the 7th of October, 1829.

He had suffered, formerly, from repeated attacks of rheumatism.

About twelve weeks ago, after exposure to damp and cold, he was seized with inflammation in nearly all his joints. In the course of a few days, the disease in the other joints had abated; but the right knee became more painful and swollen. At the time of his admission, this knee was tender, painful, and much distended with fluid, and there was a good deal of febrile excitement of the system.

Blood was taken from the neighborhood of the knee by cupping; and this was followed by the application of blisters. The *vinum colchici*, and afterwards calomel, combined with opium, were administered internally. Under this treatment the pain and swelling of the knee subsided.

On the 27th of October, he was attacked with severe inflammation of the



fauces and larynx; which, however, soon yielded to the remedies employed.

On the 31st, he complained of severe pain in the right side, with great difficulty of breathing; and on the 3d of November he died.

On examining the body after death, the pleuræ were found inflamed, and incrustated with lymph, and serum had been infused into that of the right side. The lungs, also, were inflamed, and some portions of them were in a state of gangrene. The heart was affected with hypertrophy, and the pericardium was inflamed with flakes of lymph adhering to it. The synovial membrane of the right knee was full of a dark colored fluid; not purulent, but having the appearance of a thick synovia, tinged with blood. The synovial membrane was every where of a red color, as if stained by this secretion, and the cartilages of the joint had the appearance of having been stained in the same manner. There were some small extravasations of blood in the cellular membrane external to the joint.

## SECTION II.

### *On the Causes and Symptoms of this Disease.*

It is evident that inflammation may effect the synovial membrane of a joint, by extending to it from some of the other textures of which the joint is composed, or that it may have its origin in the membrane itself. My present observations are intended to relate chiefly to cases of the latter description; and what little is to be said, in addition, respecting those of the former, will be better introduced hereafter.

Although no period of life is altogether exempt from this disease, it does not occur equally in persons of all ages. It very seldom attacks young children; becomes less rare as they approach the age of puberty; and is very frequent in adult persons. This is the reverse of what happens with respect to some of the other diseases to which the joints are liable; and a knowledge of these circumstances will be found of some importance to the surgeon, in assisting him to form a ready diagnosis.

Inflammation of the synovial membranes may take place, as a symptom of a constitutional affection, where the system is under the influence of gout or rheumatism; where it is disturbed by the operation of the syphilitic poison; where mercury has been exhibited improperly, or in too large quantities; and under a variety of other circumstances. But, in these cases, the disease, for the most part, is not very severe; it occasions a preternatural secretion of synovia; but does not, in general terminate in the effusion of coagulated lymph, or in thickening of the inflamed membrane. Sometimes it attacks several joints at the same instant, and even extends to the synovial membranes, which constitute the bursæ mucosæ and sheaths of the tendons. At other times it leaves one part to attack another, and different joints are affected in succession.

In other cases, the disease is entirely local; produced by a sprain or other injury; or the application of cold; and sometimes arising from no evident cause. The application of cold is, on the whole, the most frequent source of the complaint; and hence it is easy to explain, why it occurs much more frequently in the knee than in any other joint; and why it is comparatively rare in the hip and shoulder, which are defended by a thick mass of muscles from the influence of the external temperature. Where the inflammation is thus

confined to a single joint, it is more probable that it will assume a severe character, and that it may be of long duration. It is likely to leave the joint with its functions more or less impaired; and occasionally terminates in its total destruction. In itself it is a serious disease, but it is often confounded, under the alarming name of white swelling, with other diseases which are still more serious.

Inflammation may take place in the synovial membranes in different degrees of intensity; but for the most part it has the form of a chronic or slow inflammation; which, while it impairs, does not altogether destroy, the functions of the joint; and which, if not relieved in the first instance, by active and judicious treatment, may, like a chronic ophthalmia, continue for weeks or months, and, with occasional recoveries and relapses, may even harass and torment the patient during many successive years.

In the first instance, the patient experiences pain in the joint, which, although it affects the whole articulation, is often referred principally to one spot, being there felt more severely than elsewhere. The pain usually continues to increase during the first week or ten days, when it is at its height. Sometimes even at this period the pain is trifling, so that the patient experiences but little inconvenience from it; at other times it is considerable, and every motion of the joint is distressing and difficult.

In the course of one or two days after the commencement of the pain, the joint may be observed to be swollen. At first, the swelling arises entirely from a preternatural collection of fluid in its cavity. In the superficial joints, the fluid may be distinctly felt to undulate, when pressure is made alternately by the two hands placed one on each side. When the inflammation has existed for some time, the fluid is less perceptible than before, in consequence of the synovial membrane having become thickened, or from the effusion of lymph on its inner or outer surface; and, in many cases, where the disease has been of long standing, although the joint is much swollen, and symptoms of inflammation still exist, the fluid in its cavity is scarcely to be felt. As the swelling consists more of solid substance, so the natural mobility of the joint is in a greater degree impaired.

The form of the swelling deserves notice. It is not that of the articulating ends of the bones, and, therefore, it differs from the natural form of the joint. The swelling arises chiefly from the distended state of the synovial membrane, and hence its figure depends in great measure on the situation of the ligaments and tendons, which resist it in certain directions, and allow it to take place in others. Thus, when the knee is affected, the swelling is principally observable on the anterior and lower part of the thigh, under the extensor muscles, where there is only a yielding cellular structure between these muscles and the bone. It is also considerable in the spaces between the ligament of the patella and the lateral ligaments; the fluid collected in the cavity causing the fatty substance to protrude in this situation where the resistance of the external parts is less than elsewhere. In the elbow the swelling is principally observable in the posterior part of the arm, above the olecranon, and under the extensor muscles of the fore-arm; and in the ankle it shows itself on each side, in the space between the lateral ligaments, and the tendons, which are situated on the anterior part. In like manner in other joints, the figure of the swelling, whether it arises from fluid alone, or joined with solid substance, depends in great measure on the ligaments and tendons in the neighborhood, and on the degree of resistance which they afford; and these circumstances, though apparently trifling, deserve our attention as they enable us more readily to form our diagnosis.



In the hip and shoulder the disease occurs less frequently than in the superficial joints; and here the fluctuation of the effused fluid is not perceptible; but the existence of swelling is sufficiently evident beneath the muscles.

When the shoulder is affected, there is pain accompanied with a general tumefaction of the part; and, in most instances, if the hand be placed upon it, at the same time that the limb is moved, a crackling sensation is observed, which probably arises from an effusion of fluid into the cells of the neighboring bursæ. After some time the swelling subsides, or the joint may even appear to be smaller than natural, in consequence of the muscles, especially the deltoid, having become wasted from want of exercise.

When inflammation attacks the synovial membrane of the hip, there is an evident fullness of the groin, and, in some instances, of the nates also. There is pain, which is referred, not to the knee, as in cases of ulceration of the cartilages, but to the upper and inner part of the thigh, immediately below the origin of the *adductor longus* muscle. The pain is aggravated when the patient stands erect, and allows the limb to hang, without the foot resting on the ground. It is also increased by motion, but not by pressing the articulating surfaces against each other, so that it does not prevent the weight of the body being borne by the affected limb. The pain is often very severe, yet it does not amount to that excruciating sensation which exhausts the powers and spirits of the patient in whom the cartilages of the hip are ulcerated. From some cases, which have fallen under my observation, I cannot doubt that inflammation of the synovial membrane of the hip, occasionally terminates in dislocation of that joint. It is easy to understand how this may happen, where the synovial membrane and capsular ligament are much distended and dilated, the round ligament being at the same time separated from one of its attachments by ulceration. The head of the femur, under these circumstances, would be pushed outwards until it had passed beyond the bony margin of the acetabulum, when the action of the glutæi muscles would draw it upwards, and cause it to be lodged on the dorsum of the ilium. An example of this kind of dislocation will be found among the cases which will be related hereafter.

After inflammation of the synovial membrane has subsided, the fluid is absorbed, and, in some instances, the joint regains its natural figure and mobility; but, in other cases, stiffness and swelling remain. Sometimes the swelling has the same peculiar form which it possessed while the inflammation still existed, and while fluid was contained in the joint; and we may then suppose, that it depends principally on the inner surface of the synovial membrane having a thick lining of coagulated lymph. At other times the swelling has the form of the articulating extremities of the bones, that is, nearly the natural form of the joint; and it probably arises from the thickened state of the synovial membrane. From whichever of these causes it be that a swelling remains after the inflammation has subsided, the patient is very liable to a recurrence of the disease. Whenever he is exposed to cold, or exercises the limb in an unusual degree, and often, without any evident reason, the pain returns, and the swelling is augmented. In those cases in which the synovial membrane is thickened, although the fluid, which had been effused, is absorbed, and the principal swelling has disappeared, it occasionally happens, not only that a certain degree of inflammation still lingers in the part, but that it continues until the morbid action extends to the other textures; and ultimately ulceration takes place in the cartilages, suppuration is established, and there is complete destruction of the articulating surfaces. In this advanced stage, if we wish to know whether the inflammation of the synovial membrane, or the ulceration of the cartilages, has been the primary affection, we must form our

judgment, not from the present symptoms, but from the previous history of the case. It is, indeed, often difficult to procure a history on the accuracy of which we can rely, particularly in hospital practice ; but this is of the less importance, as whatever the disease may have been in its origin, where it has proceeded so far as has been described, there is no difference respecting the treatment ; and, for the most part, when suppuration has taken place, there is little prospect of advantage from any thing, except the removal of the limb by amputation.

I believe, that the above history will be found applicable to the majority of cases in which this disease exists. But I have before observed, that inflammation may exist in the synovial membranes in different degrees of intensity ; and occasionally it will be found to be more urgent in its symptoms, and to be more rapid in its progress, than what has been described ; having the characters of an acute instead of a chronic inflammation. Under these circumstances, the swelling takes place immediately after, or at the same instant with, the first attack of pain ; there is redness of the skin ; the pain is more severe ; and it is so much aggravated by the motion of the parts, that the patient keeps the joint constantly in the same position, and usually in an intermediate state between that of flexion and extension. In addition to these symptoms, there is more or less of symptomatic fever of the inflammatory kind. In a few days the disease, if left to itself, assumes the chronic form ; or, perhaps, under proper treatment, it subsides altogether.

It must be observed, however, that the boundaries of acute and chronic inflammation do not admit of being very well defined. These terms accurately enough express the two extremes ; but there are numerous intermediate degrees of inflammation, of which it is difficult to determine whether they should be considered as being of the acute or chronic kind. On this, and on many other occasions, the pathologist must be content if he can succeed in pointing out the principal varieties of morbid action which occur, and the symptoms which they produce, in such a manner as will enable others, with the assistance of a certain degree of original observation, to distinguish those nicer shades in the characters of disease, which language is inadequate to explain, but a knowledge of which is of considerable importance in medical and surgical practice.

It is to be supposed that the character which inflammation of the synovial membrane assumes must, in a great degree, depend on the peculiar constitution of the patient. It is, however, modified by a variety of other circumstances.

I have already observed, that the symptoms are, for the most part, more severe, and that there is a greater disposition to terminate in the effusion of coagulated lymph, and thickening of the synovial membrane, where the inflammation is strictly local, than where it is the result of some disease affecting the general system.

In syphilitic cases, it seldom happens that more than one or two joints are affected at the same time. In the early stage of syphilis, the inflammation is usually an accompaniment of a papular eruption or lichen ; there is then but little pain ; fluid is effused only in small quantity ; and when this has become absorbed, the joint is restored as nearly as possible to its original condition. In the more advanced stage of syphilis, we find it existing in combination with nodes : and here it is productive altogether of much more inconvenience to the patient ; is more difficult to be relieved ; and the synovial membrane is left thickened, and the joint somewhat larger than natural, after the fluid has disappeared. In cases of the last description, it is often impossible to deter-



mine, whether the disease can with most reason be attributed to the agency of the syphilitic poison, or to the repeated exhibition of mercury.

In cases of rheumatism, several joints are frequently affected, either at the same time, or in succession; and the synovial membranes which constitute the *bursæ mucosæ* and sheaths of the tendons, often participate in the disease. There is usually a good deal of pain and swelling, and the joints are often left stiff and enlarged afterwards. Where the inflammation is connected with gout, the pain is generally out of all proportion to the other symptoms of inflammation; and the patient compares his sensations to those, which might be supposed to arise if the joint were compressed by a vice, or if it were violently torn open.

There is a remarkable, yet not uncommon form of the disease, which may be considered as bearing a relation to both gout and rheumatism, but differing from them, nevertheless, in some essential circumstances. The synovial membrane becomes thickened, so as to occasion considerable enlargement of the joints, and stiffness, there being at the same time but little disposition to the effusion of fluid. In the first instance, the disease is often confined to the fingers; afterwards it extends to the knees and wrists; perhaps to nearly all the joints of the body. Throughout its whole course, the patient complains of but little pain; but he suffers, nevertheless, great inconvenience, in consequence of the gradually increasing rigidity of the joints, and the number which are effected in succession. The progress of the disease is usually very slow, and many years may elapse before it reaches what may be regarded as its most advanced stage. Sometimes, after having reached a certain point, it remains stationary, or even some degree of amendment may take place: I do not, however, remember any case in which it could be said that an actual cure had been effected. The individuals who suffer in the way which has been described, are, for the most part, those belonging to the higher classes of society, taking but little exercise, and leading luxurious lives; but there are exceptions to this rule, and the disease occasionally occurs in hospital practice; in men, and even in females, of active and temperate habits.

### SECTION III.

#### *On the Treatment of this Disease.*

In cases in which inflammation of the synovial membrane is connected with rheumatism, those remedies may be employed with advantage, which are useful in relieving rheumatism in other textures; such as opium combined with ipecacuanha, or other diaphoretics; preparations of the colchicum autumnale and mercury. Of the two latter, I have found reason to believe that the colchicum is to be preferred, where several joints are affected, and where the synovial membranes, which constitute the *bursæ mucosæ* and sheaths of the tendons, participate in the disease. In such cases, the wine of the root of colchicum may be administered in doses varying from 15 to 30 minims, three times daily, or in some instances, the acetous extract of colchicum may be given in alterative doses of 2 or 3 grains every night. On the other hand, mercury is preferable where only one or two joints are affected at a time; but where there has been a manifest translation of the disease, either from some internal organ, or from one joint to another. The form of,

mercury, most generally useful under the circumstances, is that of calomel combined with opium; and it should be administered in such doses as to effect the gums, or to produce some other indication of its action on the general system.

In those cases in which the patient complains of an excruciating grinding pain, or of a sensation as if the joint were torn open, and in which I have already stated that the disease probably bears some relation to gout, the relief produced by the exhibition of colchicum is even more remarkable than in cases of rheumatism; being, in some instances, almost immediate, after leeches and other remedies have been employed to no purpose.

Where inflammation of the synovial membrane arises from syphilis, it will probably disappear under a well regulated course of mercury; and where it seems to have arisen from the protracted or injudicious use of mercury, or from mercury acting on a peculiar constitution, sarsaparilla may be given with advantage. This last medicine is especially useful where the affection of the joints occurs in combination with diseases of the bones and periosteum.

In cases of that peculiar chronic disease, which is described in the concluding part of the last section, in which many joints, and sometimes nearly all the joints of the extremities are effected in succession, it is of importance that the greatest attention should be paid to the general health, so that it may be maintained in as good a state as possible. As long as he is capable of doing so, the patient should take sufficient exercise daily, to induce a moderate degree of perspiration; he should live on a simple diet, avoiding especially raw fruit and acids, and whatever is not of easy digestion; and taking fermented liquors only in small quantity. The bowels should be kept gently open by means of rhubarb, or compound decoction of aloes, or some other of the same class of aperients. It has appeared to me also that, in these cases, patients have derived benefit from the use of acetous extract of colchicum, exhibited at intervals of six or eight weeks, for 10 or 12 successive nights, in small or alterative doses; and still more from the long-continued use of alkalis. The carbonate of potash usually agrees with the stomach better than the pure potash. Ten or fifteen grains may be given twice daily, in the middle of the day and evening, and continued, with occasional intermissions for many months.

But specific remedies are applicable to only a limited number of cases. For the most part, the disease is to be subdued by being treated as a simple local affection, and in no instance is such kind of treatment to be altogether neglected.

In the acute form of the inflammation, leeches may be applied in the neighborhood of the part affected; and if there be much symptomatic fever, blood may be taken from the arm, and the bleeding may, or may not, be repeated, according to circumstances. Attention should be paid to the state of the bowels, and saline draughts may be given with some diaphoretic medicines. If the swelling has rapidly risen to such a height as to occasion considerable tension of the soft parts, the pain will be best relieved by means of warm fomentations and poultices; but otherwise cold evaporating lotions seem to produce a better effect. Under this treatment the acute inflammation of the synovial membrane in general speedily subsides.

The chronic inflammation is relieved more slowly. In the first instance, the joint should be kept in a state of perfect quietude. Blood should be taken from the part, by means of leeches or cupping. The latter method is preferable; the sudden abstraction of blood, which can be thus effected,



being more beneficial than the more gradual hæmorrhage which is procured by leeches. It will in general be right to repeat the blood-letting twice or three times, or even oftener; and, in the intervals, compresses may be laid on the part, moistened with some cold lotion. When the inflammation has been in great measure subdued, a blister may be applied; and, if necessary, several blisters may be employed in succession, with more advantage than a single blister kept open by means of savine cerate. The blisters should be of a considerable size; and if the affected joint be deep-seated, they may be applied as near to it as possible; but otherwise a blister is frequently of more service when applied at a little distance. For example, if the synovial membrane of the hip be inflamed, the blister may be placed on the groin or nates; and if the disease be in the wrist, it may be applied to the lower part of the fore-arm. Under this treatment the pain is usually relieved; and in a few days the swelling, as far as it depends on fluid collected in the joint, is much diminished. Even when the tumor is solid, arising from the effusion of coagulated lymph, it will in a considerable degree subside, and sometimes be entirely dispersed, provided that the lymph has not yet become organised. Blisters are of more service, with respect to the removal of the swelling, than any other remedies; but they should not be employed without the previous abstraction of blood, except when the inflammation is slight, and when fluid is effused without any admixture of solid substance.

When I have seen the knee joint much distended, I have, in some instances, ventured to evacuate the fluid by puncture; and the following is the result of my experience as to the effects of this operation:—

1st. In a thin person, if a few punctures be made with an instrument, a very little broader than a couching needle, by means of an exhausted cupping glass applied over the punctures, a large quantity of fluid may be easily abstracted without the smallest danger, and with no inconsiderable relief to the patient. But while inflammation exists, the relief is not permanent; the fluid being rapidly regenerated; so that in a day or two, or perhaps in a few hours, the swelling is as large as ever. If, on the other hand, the inflammation be already subdued, the absorption of the fluid usually goes on so rapidly, that any more expeditious method of removing it is unnecessary. 2dly, If suppuration has taken place in the joint (not in consequence of ulceration, but from the surface of the synovial membrane), a free opening made into it with a lancet will often be attended with the best effects. I have known, under such circumstances, ankylosis to become established, almost immediately, and the patient to obtain a speedy cure with an ankylosed joint. The most prudent method of proceeding, is to make a puncture with a needle first, and allow a small quantity of fluid to escape, so as to ascertain its nature. If it be not simply turbid serum, but actual pus, the lancet may be used afterwards.

When the inflammation is in great measure relieved; liniments, which irritate the skin, may be rubbed on twice or three times in the day. Most of the liniments of the Pharmacopœia are not sufficiently stimulating for this, nor, indeed, for other purposes. The *linimentum camphoræ compositum* may be employed pure; or the *linimentum saponis* may be made stronger by the addition of *liquor ammoniæ* and *tinctura lyttæ*; and the powers of the *linimentum ammoniæ* may be augmented in the same manner, or by the addition of the *oleum terebinthinae*. The following liniment is more stimulating than those in common use; and as its effects are more permanent, it seems to me, in many cases, to be productive of better effects, with respect to the disease.



℞ Olei Olivæ ℥iss.  
 Acidi Sulphurici ℥iss.  
 Olei Terebinthinæ ℥iss.  
 Fiat linimentum.

It may be used of this strength for the class of persons who apply at a hospital for relief ; but for those of a higher class in society, in whom the cuticle is generally thinner, and the cutis more tender, the proportion of the sulphuric acid should be somewhat less. The effect of this liniment is to excite some degree of inflammation on the skin ; the cuticle becomes of a brown color, and separates in thick, broad scales ; and the inflammation of the internal parts is relieved, probably on the same principle as by a blister. Another liniment, which is also very useful, is one frequently recommended, consisting of a dram (or more) of the *antimonium tartarisatum* mixed with an ounce of the *unguentum cetacei*. This produces a pustular eruption of the skin ; which, like other eruptions of the same kind, runs its course, and, during a certain period of time, operates very beneficially by abstracting the inflammation from the other parts.

Stimulating plasters, such as the *emplastrum ammoniaci cum hydrargyrio*, act on the same principle as stimulating liniments, and are useful under the same circumstances, but they are, on the whole, a less convenient application.

Issues and setons may be of some service in chronic cases, in abating the symptoms of inflammation of the synovial membrane ; but they are more especially beneficial where there is reason to believe that a secondary disease has begun to exist in the form of ulceration of the cartilages ; and of their use, under these circumstances, I shall have occasion to speak hereafter.

No other active remedies seem to be productive of much benefit. But a great deal may be accomplished by mere negative treatment. Not only in cases of inflammation of the synovial membrane, but in all other cases in which actual disease of a joint exists, the disease, whatever it may be, is kept up and aggravated by motion and exercise ; and whatever means can be employed so as to keep the joint in a state of complete repose, will go far towards the production of a cure. In the early stage of acute inflammation of the synovial membrane, indeed, no interference on the part of the surgeon is necessary for this purpose ; the pain which the patient experiences on every attempt made to use the limb being sufficient to prevent him using it. But it is otherwise when the inflammation has in a great degree subsided. At this period the motion of the joint occasions little or no inconvenience at the time, although it invariably tends to aggravate the symptoms afterwards. It is difficult to persuade a patient thus situated to submit to a very rigid system of confinement ; and if he should do so, there is always danger, in protracted cases, that his general health may suffer in consequence. It is important that he should not be altogether deprived of the opportunity of taking air and exercise yet it is necessary that the affected joint should be kept in a state approaching as nearly as possible to one of complete repose. This double object may be attained by means of a proper bandage : applied so as to restrain the motions of the joint, at the same time that it makes no more than a moderate degree of pressure on it. As to the best mode of carrying this plan into execution, the surgeon must exercise his own judgment in each individual case. If the disease be far advanced, and there is danger of the cartilages being ulcerated, he will find it prudent to restrain the motions of the joint altogether, by the application of pasteboard splints, confined by a roller, or even by cir-

cular stripes of adhesive plaster on their outside. In other cases, the bandages, &c., recommended by Mr. Scott, in his ingenious work on the diseases of the joints, will be productive of the best results.\* There is a bandage which is very well suited to cases of this kind, which, in one part of its circumference, is composed of a stiff leather, elsewhere of an elastic material, and secured by a lace or buckles, so that it admits of being secured with any degree of tightness. If the seat of the disease be in the knee, there may be a single piece of leather, adapted to the shape of the posterior part of the limb; if it be in the elbow, there may be a double piece of leather one on each side, and thus the construction of it may be varied so as to adapt it to any of the other articulations. In some instances much support may be wanted, and the leather should be stiff and unyielding: extending a considerable way above and below the joint. In others, where little support is necessary, the leather may be more pliant, and it should not extend beyond the immediate neighborhood of the part affected. Such a bandage is worn with the greatest comfort, and it fully answers the intended purpose. As it may be removed or applied by the patient's own hands, the use of it is quite compatible with that of the stimulating liniments which I have formerly mentioned.†

After inflammation of the synovial membrane has entirely subsided, if we find the joint left with its mobility only in a slight degree impaired, we may very safely leave it to itself. Time and the restorative power of the constitution will complete the cure. But if there be considerable stiffness and thickening of the soft parts a further application of blisters will often be useful in promoting the absorption of the lymph, which has been effused. I have also known much benefit to arise, under these circumstances, from the use of *moxa* in the way recommended by Mr. Boyle; that is, the application of it being so managed, that the heat should penetrate into the soft parts, without making an eschar, and scarcely making a blister.

At a still later period, friction made by the hand, with starch, or other fine powder, will be productive of great advantage.

The friction, however, should be employed with caution, as when used too freely, it sometimes occasions a return of the inflammation. Whenever there is the slightest indication of this being the case, it should be omitted, blood should be taken from the part, and some time should elapse before the friction is resumed. Friction is sometimes productive of very essential benefit, but not unless it be employed to a considerable extent; that is for two or three hours daily, and during a long period of time. It is, however, a remedy which is applicable only under certain circumstances. We must always bear in mind that friction is useful in relieving some of the effects of disease, but not disease itself; and those who recommend it without attention to this principle, in these and in other cases, will often find it to be productive of very injurious consequences.

I have sometimes tried the effect of pumping hot water on a stiff joint, as recommended by Le Dran, and as now practised at some watering places.

\* A very convenient mode of applying bandages in these cases is as follows:—Let it be supposed that the disease is in the knee. Circular stripes of leather spread with the *emplastrum plumbi*, are to be applied round the joint, and extending some way above and below it; care being taken that a space is left for the patella; on which there ought to be as little pressure as possible. Over this a calico roller (four or five yards for an adult) may be applied, and over this again a few circular stripes of linen, spread with adhesive plaster, with another calico roller over the whole. A bandage of this kind, carefully adjusted, may not require to be changed for six or eight weeks, and is very convenient to the patient.

† Bandages of this kind are made by Shoobred & Co., in Jermyn Street; and by Sparkes, in Old Bond Street.



The blow of a column of water, falling from a height of several feet, produces considerable friction, even so as to excoriate the surface, with which are combined the relaxing powers of heat and moisture. This practice is certainly productive of benefit; but the observations just made apply to this as well as the other modes of producing friction.

Whenever friction is useful, the vapor bath is useful also. The joint may be alternately bent, and extended, rubbed and champooed, while it is in the bath, and a degree of force may be applied to it, under these circumstances, which it would be unsafe to employ otherwise. All these methods of treatment, however, require time, and the exercise of much patience; and whoever expects the stiffness consequent on a severe attack of inflammation of the synovial membrane to be speedily removed, will not fail to be disappointed. In some cases, where the inflammation has been unusually severe, or of unusually long continuance, complete ankylosis having taken place, no plan of treatment can be successful in restoring the motions of the joint, and the patient must submit to the inconvenience of a stiff joint ever afterwards.

#### SECTION IV.

##### *Cases of Inflamed Synovial Membrane.*

The cases, which I am about to relate, will serve to illustrate some of the observations respecting the inflammation of the synovial membranes, which I have already made; and also to explain some circumstances which will be found to occur in practice, and which could not have been so well introduced in the general history of the disease contained in the preceding pages. Whoever will take the pains to compare these cases with each other, and with those which I shall relate hereafter, will, if I am not exceedingly mistaken, be convinced that the distinction of the different diseases of the joints is not a mere matter of curiosity, which may be interesting to the morbid anatomist; but that these diseases are different in their progress; that they produce different symptoms, by which they may be known from each other in the living person, and which indicate the employment of different remedies for their relief.

CASE V.—John Adams, forty-seven years of age, on the 21st of August, 1811, was seized with a pain in his left knee, and in the course of a few hours he found the joint to be swollen. This was accompanied by a slight attack of fever.

On the 28th of August he was admitted into St. George's Hospital. At this time the knee was extremely painful and tender, and much swollen, the swelling not having the form of the articulating ends of the bones, but being most prominent on the anterior and lower part of the thigh, underneath the lower portion of the extensor muscles. The fluctuation of fluid might be distinctly felt within the synovial membrane.

Eight ounces of blood were taken from the knee by cupping. The loss of blood was immediately followed by an abatement of the pain, tenderness, and swelling. On the 30th of August, a blister was applied.

The cupping was repeated on the 9th and 18th of September, and on the 4th of October; and each time was followed by the application of a blister.

On the 10th of October, the joint was free from all pain and tenderness. It was stiff, and still slightly swollen; but no fluid was perceptible, the swell-

ing appearing to arise entirely from solid substance. He was directed to use a stimulating liniment twice in the day.

On the 18th of October there had been no return of inflammation, and the stiffness and swelling were diminished. Friction was now employed, by means of the hand, with starch powder, every morning and evening; and in a few days afterwards, it was directed, in addition to the friction, that hot water should be pumped on the joint, so as to fall on it from a height of several feet for half an hour every morning.

About the middle of November he was dismissed from the hospital; the joint being now nearly as small, and as movable as before the inflammation had taken place.

CASE VI.—Robert Stewart, eighteen years of age, was admitted into St. George's Hospital on the 26th of January, 1814.

He said that, about seven weeks before his admission, the right knee had become swollen and painful, without any evident cause. The pain and swelling took place about the same time. The pain was severe, and attended with some degree of fever. About a fortnight before his admission, the joint was cupped, and the swelling and pain became much diminished, and the leg more movable. The cupping had been repeated on the day previous to his coming to the hospital, and again afforded him relief.

At the time of his being admitted into the hospital, the knee was still much swollen, the swelling extending up the anterior and lower part of the thigh under the extensor muscles; and it appeared to arise chiefly from solid substance effused within the articulation, very little fluid being to be distinguished. There was but little pain or tenderness; the joint admitted of a limited motion; he said it was less stiff than it had been a short time before.

On the 27th of January, eight ounces of blood were taken from the knee by cupping, and afterwards a blister was applied.

On the 5th of February the blister was healed. The swelling was much diminished. The solid substance, which had been effused, was in great measure absorbed; so that the form of the articulating ends of the bones could be distinguished. The blister was repeated.

On the 18th of February, the joint was scarcely larger than natural, but it was still stiff in a slight degree. The stiffness disappeared under the employment of friction with mercurial ointment and camphor, and on the 23d of February he was dismissed from the hospital as cured.

CASE VII.—John Hannam, a stout middle-aged man, was admitted into St. George's Hospital, under Mr. Keate, on the 22d of May, 1811.

He said that, six years ago, he had wrenched his right knee, which in a few hours became swollen and painful. In the course of a month the pain and the swelling subsided, and he returned to his duty as a soldier, in one of the regiments of Life Guards; but from that period he experienced what he termed a weakness of the joint; and he had a return of pain and swelling whenever he made any unusual exertion. A year and a half previous to his coming to the hospital, he was ill of a fever. From this time the knee was more swollen and painful; and he continued in this state, sometimes better, sometimes worse; so that he was unable to do his duty, and he was in consequence discharged from his regiment.

At the time of his admission the knee was swollen; partly from fluid in its cavity, partly from thickening of the soft parts. The swelling extended some way up the anterior part of the thigh, and was prominent on each side of the ligament of the patella. The joint was stiff, but admitted of an imperfect flexion and extension. He complained of some degree of pain when at



rest; but the pain was more severe whenever he attempted to exercise the limb. There was an enlarged lymphatic gland in the groin.

The knee was cupped several times, and always with advantage. Blisters and stimulating liniments were employed, and about the end of September, he left the hospital, better than when he was admitted; but there was still pain whenever he made any unusual exertion, and the joint was swollen and stiff, though in a less degree than formerly. The swelling now appeared to arise altogether from solid substance, no fluid being perceptible.

Fifteen months afterwards I had an opportunity of seeing the patient again. There was very little alteration in the state of the knee. He said that, whenever he took more exercise than usual, or was exposed to cold, inflammation took place, and the swelling was increased; but that, by remaining for a short time in a state of quietude, these symptoms were always relieved.

The three preceding cases are sufficient to illustrate the ordinary characters, and the ordinary progress of this disease. Those which follow are intended to explain certain circumstances, which, although of less frequent occurrence, are occasionally met with, and which it is of much consequence for the surgeon to understand.

**CASE VIII.**—A young gentleman, about thirteen years of age, in July, 1817, was seized with inflammation of the synovial membrane of one knee, attended with the usual symptoms. Blood was taken from the knee by means of leeches and cupping, cold lotions were applied, and the violence of the inflammation subsided. In the beginning of October a blister was applied; and, at the end of October, the knee was in the following state. It was larger than the other; the swelling having the form of the articulating extremities of the bones, and appearing to arise from a thickened state of the synovial membrane. The joint admitted only of a limited degree of motion, and the motion of it beyond a certain point was productive of pain. He was now directed to employ friction with a stimulating liniment.

The complaint continued very nearly in the same condition until the middle of November, when the swelling became suddenly reduced, and almost wholly disappeared. But on the same day he complained of an acute pain in his head, shooting from the temples to the forehead just above the eyebrow. This pain went off in a few hours, leaving only a slight soreness; and for several days it returned periodically, in the form of a nocturnal paroxysm, of great severity, but of only a few minutes' duration. Leeches and blisters were applied both to the head and legs; and purgatives were administered. At the end of a week the pain ceased; but he was seized with great somnolency, which was soon followed by strabismus, partial blindness, and almost total cessation of speech; and, after remaining in this state about a week, he died.

The body was not examined.

**CASE IX.**—James Burton, forty years of age, was admitted into St. George's Hospital on the 2d of June, 1813, laboring under a complaint of his left knee. He said that, two years ago, the joint became painful and swollen, at first in a slight degree, but afterwards the pain and swelling increased; and he observed that the symptoms were always aggravated on the coming on of cold or wet weather. For the last nine months he had been unable to use the joint sufficiently to enable him to attend to his usual occupations. Blisters and issues had been employed at various times, and, as he thought, with some temporary relief. At the time of his admission the knee was swollen, in consequence of fluid being collected within the cavity of the synovial membrane.



The fluid might be distinctly felt to fluctuate underneath the patella when the two hands were placed, one on each side of the joint. The soft parts were somewhat, but not considerably, thickened. He had very little pain except on motion; was unable to bend the leg beyond the right angle, but could extend it completely. The swelling of the joint appeared greater than it really was, on account of the wasting of the muscles of the thigh and leg.

Blood was taken from the knee by cupping; and afterwards several blisters were applied in succession. He took five grains of the *pilula hydrargyri submuriatis composita* every night. On the 2d of August a blister was applied, and kept open by dressing it with the savine cerate. At the end of three weeks he complained of pain, and a sense of irritation, extending up the thigh and down the leg. These symptoms were attributed to the open blister, and were immediately relieved when the blistered surface was allowed to skin over. On the 20th of September he quitted the hospital, being free from all his former symptoms, except that there was still a slight degree of stiffness of the joint.

In the beginning of July, 1815, the same patient came again under my observation. At this time, both knees were distended with fluid; the right shoulder was swollen, but in a less degree; and there was a collection of fluid in the synovial membrane which forms the sheath of the tendons on the posterior part of each wrist. On examining the right knee, which was the most swollen of the two, a sensation was communicated to the hand, as if produced by a number of small loose substances, of a soft consistence, within the cavity of the joint; and just perceptible to the touch. The joints were movable, and very little painful. He said that all these swellings had begun about three months after he formerly quitted the hospital, with a slight degree of pain, and had gradually increased.\*

I suspect the loose substances, which were felt within the knee in this case, to have been portions of coagulated lymph, which had been effused on the inner surface of the synovial membrane, and afterwards had become detached; similar to those which are sometimes formed in the cavity of an inflamed bursa mucosa, and which I shall have occasion to describe hereafter. I had not the opportunity of observing the subsequent progress of the disease in this patient; and I have never been able to ascertain the correctness or incorrectness of this opinion, respecting these loose substances, by dissection. They are certainly of a different nature from the loose cartilages, which are met with in other cases.

CASE X.—Amy Brookes, fifty-four years of age, was admitted into St. George's Hospital on the 10th of June, 1818. Three years ago, her right knee became swollen and painful, and the pain and swelling had existed ever since, sometimes in a greater, sometimes in a less degree. At the time of her admission the knee was much swollen, in consequence of fluid collected in its cavity. There was pain in the joint, which was aggravated by motion; but which was not sufficient to interfere with her rest at night, or to prevent her going about her usual occupations. On examining the knee a sensation was given to the hand, as if some soft loose substance was formed

\* These cases are given as they stood in the former edition of this work, and as they sufficiently illustrate the principal circumstances in the history of the disease. But it should be observed, with respect to some of them (that of Burton and of Hannam, for example) that the practice employed in St. George's Hospital for some years past, would have been, after the inflammation had subsided, to apply pasteboard splints or bandages, so as to restrain the motions of the joint, and that there is no doubt that the recovery of the patients under this treatment would have been more rapid and more complete.

within the joint; and a crepitus was distinguished, on moving the patella from one side to the other.

During the time of her stay in the hospital, blood was taken from the knee twice by cupping, and once by leeches; and two blisters were applied. July 15th, she was discharged as cured; there was no pain nor swelling; the loose substance was no longer perceptible, and the crepitus could scarcely be distinguished.

The crepitus which was observed in this case, occurs in a few instances, and I know not positively to what cause it is to be attributed. It is different from that which I have met with, where there has been reason to believe that the cartilages are destroyed, so as to expose the bone underneath; and if this had been the cause of it, we must suppose that it would have been permanent, or, at any rate, of longer duration. Probably it may have depended, in this case, on an effusion of albumen (coagulated lymph), or on the synovia having been secreted of a different quality from what is usual.

The following case affords an example of inflammation of the synovial membrane of the hip terminating in dislocation.

CASE XI.—Master L., being at that time about eight years of age, was attacked, towards the end of September, 1824, with what was believed at the time to be inflammation of one of the parotid glands, attended with a good deal of fever. After six or seven days, and apparently in consequence of the application of cold lotions to the cheek, the inflammation left the parotid gland, and attacked one shoulder and arm; and at the end of two or three days more it left the shoulder and attacked one of the hips. For six or eight weeks he suffered most severely from pain referred to the inside of the thigh, extending from the pubes as low down as within two or three inches of the inner condyle of the femur, and attended with a great deal of fever. There was no pain in the knee. The surgeon, who was then in attendance, applied leeches to the hip, lotions, &c., and afterwards made an issue with caustic behind the great trochanter. The fluctuation of fluid was perceived at the posterior point of the hip, and it was supposed that an abscess had formed. However, no puncture was made, and the fluid gradually became absorbed. In March, 1825, Master L. was sufficiently recovered to be able to walk about; but it was discovered that the limb was shortened. In November, 1825, I was consulted respecting him. At this time there was all the marks of a dislocation of the hip upwards and outwards. The limb was shortened, the toes turned inwards, and the head of the femur was distinctly to be felt on the posterior part of the ilium above the margin of the acetabulum.

The following case furnishes an example of a disease, which, as far as I know, has not been described by any pathological or surgical writer. One of the most remarkable symptoms which the disease produces, is an inflammation of the synovial membranes; for which reason it is to be regarded as connected with the present subject, and may be properly introduced in this place.

CASE XII.—A gentleman, forty-five years of age, in the middle of June, 1817, became affected with symptoms resembling those of gonorrhœa. There was a purulent discharge from the urethra, with *ardor urinæ* and chordee. On the 23d of June he first experienced some degree of pain in his feet. On the 24th the pain in the feet was rather increased, but not in a sufficient degree to prevent his walking four miles. There was some appearance of inflammation of his eyes.

June 25th, the pain in his feet was more severe; the *tunicæ conjunctivæ* of his eyes were much inflamed, with a profuse discharge of pus.



The symptoms increased in violence, the pulse varying from 80 to 90 in a minute; the tongue being furred; and the patient being restless and uncomfortable during the night. The whole of each foot became swollen; there was inflammation of the synovial membranes of the ankles; and it appeared to me, that the affection of the feet themselves arose from inflammation of the synovial membranes belonging to the joints of the tarsus, metatarsus, and toes. He said that he could compare the pain which he experienced, to nothing else than that which might be supposed to arise from the feet being squeezed in a vice.

On the 27th of June the left knee became painful, and on the following day the synovial membrane of this joint was found exceedingly distended with synovia. He was now completely crippled; compelled to keep his bed, and scarcely able to vary his position in the smallest degree without assistance. The inflammation of the eyes and urethra was somewhat abated.

June 30th, the inflammation of the eyes and urethra had much subsided, and the purulent discharge was diminished. The pains of his joints were less severe; and the feet were less swollen. On the following day the knee was less swollen also.

He continued to mend, and on the 10th of July the swelling of the feet was still further diminished, and that of the knee had almost wholly disappeared. His pulse continued to vary from 80 to 90 in a minute, and his tongue was still furred. He had pain in the feet and knee, but less severe than formerly, and he was restless at night.

July 13th, he complained of pain in the right knee, and on the following day there was pain also of the right elbow and shoulder.

The right knee afterwards became swollen from fluid within the cavity of the synovial membrane, but not in the same degree with the other knee, and the swelling soon subsided. There was never any perceptible swelling of the shoulder and elbow.

August 1st, all his pains were abated. The eye and the urethra were nearly free from inflammation, and the purulent discharge was scarcely perceptible.

August 5th, he was free from pain except on motion; the joints, which had been affected, were stiff; but he was able to move about on crutches.

From this time he progressively mended. The stiffness of the joints diminished very slowly; but he was free from all uneasiness. He was longer in recovering the use of the shoulder, than that of the other joints.

In the following December, 1817 (at which time he had nearly, but not completely, recovered the use of his limbs), he had another attack of the complaint. The symptoms were the same as formerly, taking place in the same order, and pursuing the same course, but with a much less degree of violence. This second attack lasted about six weeks; and left him again considerably crippled.

In March 1818, he became affected with an ophthalmia, but of a different nature from that which he labored under in the preceding summer. The inflammation was seated in the proper tunics of the eye; and it appeared probable that it would speedily have terminated in adhesions of the iris, and destruction of the powers of vision, if its progress had not been arrested by repeated blood-lettings and the use of mercury. He had another attack of ophthalmia of the same kind four years afterwards (1822).

In order that the history of the disease might be rendered as simple as possible, I have described the symptoms in this case without hitherto adverting to the treatment which was employed.—Leeches, and blisters to the knee; li-

niments rubbed on the knees and shoulders; and fomentations when there was severe pain, formed the principal topical remedies. Of the various medicines which were exhibited, none seemed to be productive of benefit, with the exception of the *vinum colchici*. It was under the use of this medicine, that not only the pains and swellings of the joints, but that even the purulent inflammation of the eyes and urethra first began to subside: and I am on the whole, inclined to believe that my patient was indebted to it for a much more speedy recovery than he would have obtained otherwise.

I have had the opportunity of seeing many other cases, in which a similar train of symptoms took place.

One gentleman (at the time when these notes were taken) had as many as nine attacks of this complaint. The first took place when he was under twenty years of age, and the others at various intervals in the course of the next twenty years. In one of them the first symptom was inflammation of the urethra, attended with a discharge of pus, although from particular circumstances, he could not believe that he had been exposed to the risk of infection. This was followed by purulent ophthalmia, and that by inflammation of the synovial membranes. In three of the attacks, a purulent ophthalmia was the first symptom; which was followed by inflammation and discharge from the urethra; and then the synovial membranes became affected: and in the other four attacks, the affection of the synovial membranes took place without any preceding inflammation either of the eye or urethra. The disease was not confined to the synovial membranes of the joints, but those of the bursæ mucosæ were inflamed also. In some of the attacks, the muscles of the abdomen were painful and tender, and subject to spasmodic contractions; and there was an occasional impediment to breathing, which seemed to arise from a similar affection of the diaphragm. The acute form of the disease, in this case, lasted from six weeks to three months, but nearly a year generally elapsed before the use of the limbs was perfectly restored. He had an attack in July, 1817; and in the beginning of May, 1818, while he was still lame, he was seized with a very violent inflammation of the sclerotic coat and iris of one eye, which was subdued by very copious blood-letting, and the exhibition of mercury. He had an other attack of the disorder in the year 1820, and in the winter of 1822 he became affected with an inflammation of the iris and sclerotic coat of the other eye, which was also relieved by blood-letting and the use of mercury.

Another gentleman gave the following history of his complaints. In the year 1809, he had symptoms resembling those of gonorrhœa; and, when these had continued for some time, one testicle became inflamed and swollen. This was followed by a purulent ophthalmia, and inflammation of the synovial membranes. In the year 1814, he had a similar attack, with the exception of the swelled testicle; and in the year 1816, when I was consulted, he still labored under a chronic inflammation of the synovial membranes of the knees and ankles, the consequence of the last attack, and by which his lower limbs were completely crippled.

In a fourth case, the patient labored under a severe ophthalmia, which was followed by inflammation of the urethra, and then the joints became affected; but I had no opportunity of watching the progress of this case, nor have I heard any other particulars of it.

In another case, the patient labored under strictures of the urethra. He had had four attacks of the disease, which has been just described, in the course of a few years. The inflammation of the urethra was in all of them the first symptom; which was followed by purulent ophthalmia, and afterwards by



inflammation of the synovial membranes, and swelling of nearly all the joints. In two of these attacks, he attributed the discharge from the urethra to his having received the infection of gonorrhœa, and in the two others to the use of the bougie.

I shall conclude this chapter with the histories of two cases, one of which bears a near relation to those which I have just described, and is introduced chiefly as it shows the good effects produced occasionally by the exhibition of the colchicum; while the other affords an example of the advantage derived from the exhibition of mercury, under certain circumstances.

CASE XIII.—A gentleman, twenty-three years of age, in the beginning of July, 1819, rode 24 miles on horseback, trotting very hard on account of rain. Two days afterwards he observed a slight swelling of the left knee; but this did not prevent his going about his usual occupations. About the middle of July, a slight purulent discharge took place from the urethra, with little or no pain. On the first of August, he walked a considerable distance, and found the knee to be more painful. On the 2d of August, he applied to me, with the knee very much swollen and very painful. Twenty leeches were applied, and afterwards a cold lotion; but this gave him no relief.

August 3d, the pain had much increased, so that it was excruciating. He was bled in the arm, and was in much less pain afterwards. Some saline medicine with the *pulv. ipec. comp.* was administered. In the evening a blister was applied; but, as soon as the blister began to act, the pain returned and was as severe as formerly.

August 5th, he continued suffering very much from pain.

August 6th, the pain was very intense in the knee. The purulent discharge from the urethra was rather increased. There was a slight degree of inflammation of the *tunica conjunctiva* of the left eye. He was bled, with little or no relief. A saline draught, with a few grains of the *pulvis ipecac. comp.* and 20 drops of the *vinum (radicis) colchici*, was administered every six hours. When he had taken four doses of this medicine he became sick, and vomited, and was afterwards purged. The colchicum was discontinued.

August 7th, he was quite free from pain, but the synovial membrane was much distended with fluid.

August 15th, the knee had continued free from pain, but was much swollen. With a view to promote the absorption of the fluid, another blister was applied; but, as soon as it began to produce its effect, the pain returned more excruciating than ever; and continued so on the following day, August 16th, when the *vinum colchici* was again administered. As soon as he had taken three doses of 20 drops each, he was sick and purged, and this was followed by an immediate and complete relief from pain.

August 17th, he was free from pain, except on motion.

August 18th, the swelling began to subside, and in the course of a few days it had entirely disappeared, and he was quite recovered.

The inflammation of the eye subsided, without any particular local treatment, in about ten days from the period of its commencement. The purulent discharge from the urethra continued for some time afterwards. The pain in the knee, in this case, was of such a kind as to be almost insupportable. The patient said that he could compare it to nothing but the sensation which he might suppose to be produced by the joint being forcibly torn open. The pulse was never accelerated, except at those times when the pain was most intense. Purgatives and other remedies were administered in the course of the disease, but nothing seemed to be productive of benefit, except the *vinum colchici*.

CASE XIV.—John Welsh, thirty years of age, was admitted into St. George's Hospital, on the 21st of February, 1827.

The right knee was much distended with fluid. He complained of constant pain in the joint, and of painful startings of the limb at night; by which he was frequently awakened from his sleep. The pain was aggravated by every motion of the joint, and by pressing the articulating surfaces against each other. The pulse beat 100 in a minute.

He stated that, nearly five months ago, he had been a patient in the Middlesex Hospital, on account of an inflammatory affection of his chest; and that blisters had been at that time applied to his side. As soon as the inflammation of the chest was relieved, both his knees became swollen and painful. He was then made an out-patient. The inflammation of the knees abated under the use of liniments; but towards the end of December, 1826, the right knee became again inflamed, and continued until the period of his being admitted into St. George's Hospital. Blood was taken from the knee by cupping; and the *pulvis ipecacuanhæ compositus* was directed to be given every night. Afterwards the cupping was repeated, several blisters were applied in succession; and ʒss. of the *vinum radici colchici* was administered three times daily for three successive days, when it was discontinued on account of it having acted considerably on the bowels.

Under this treatment, however, little or no amendment took place with respect to the local disease, and the pulse rose to 108.

March 17. I was led to suspect that the fluid in the joint might be purulent. In order to ascertain this, I punctured the knee with a narrow sharp-pointed instrument; and by applying a cupping glass over the puncture, drew off between two and three ounces, not of pus, but of turbid serum, with small flakes of coagulated lymph floating in it.

March 20. The fluid had become again collected in the joint, so that the swelling was as large as ever. The pain, however, had been manifestly relieved by the puncture. Pulse 110. The man complained of pain, referred to the right ulna and to the forehead, which he said he had felt for the last week.

He was directed to take the following pill three times daily:—

R. Hydrargyri submuriatis, gr. ij.  
Opii gr. ss.  
Fiat pilula.

March 27. The pains in the head and ulna were relieved. The knee was less swollen and painful. Pulse 100. The gums were beginning to be sore. It was directed that the pill should be taken twice daily.

March 31. The knee was much improved. Pulse 88. It was ordered that the pill should be taken only once daily.

April 10. After having been quite free from pain in the knee, he had a slight recurrence of it; on account of which, it was thought advisable to apply leeches, and afterwards a blister.

From this time he continued to mend.

April 28. The mercurial pills were discontinued, and soon afterwards he was dismissed as cured.



## CHAPTER II:

## ON ULCERATION OF THE SYNOVIAL MEMBRANE.

WHEN an abscess has formed in a joint, an ulcerated opening takes place in the synovial membrane, through which the matter is discharged. The following are the only cases, which have come under my observation, in which ulceration of the synovial membrane has occurred as a primary affection. The most remarkable circumstance which they demonstrate is, that a disease apparently slight, and of a part which is in no way concerned in the vital functions, should produce such a degree of disturbance of the constitution, as to occasion death. Of this, however, they form, by no means, a solitary example; and every surgeon and physiologist will be able to call to mind numerous other instances, which show that an impression made upon a small part of the nervous system may derange, and ultimately destroy, the functions of the whole animal machine.

CASE XV.—A young lady, nine years of age, being at play on the 1st of January, 1808, fell and wrenched her hip. She experienced so little uneasiness, that she walked out on that day as usual. In the evening she went to a dance; but while there was seized with a rigor; was carried home and put to bed. Next morning she was much indisposed, and complained of pain in the thigh and knee. On the following day she had pain in the hip, and was very feverish. These symptoms continued; she became delirious; and she died just a week from the time of the accident.

On inspecting the body on the following day, the viscera of the thorax and abdomen were found in a perfectly healthy state. The hip joint on the side of the injury contained about half an ounce of dark-colored pus; and the synovial membrane, where it was reflected over the neck of the femur was destroyed by ulceration, for about the extent of a shilling.

CASE XVI.—A middle-aged man, who had met with a contusion of one shoulder, was admitted into St. George's Hospital in the winter of 1812. He complained of pain and tenderness of the shoulder, and a very slight degree of swelling was observable: but his principal disease was a fever, resembling typhus in its character, of which he died in a few days after his admission.

On inspecting the body, about half an ounce of thin pus was found in the shoulder-joint. The synovial membrane bore marks of general inflammation, and in one spot, where it was reflected over the neck of the os brachii, it was destroyed by ulceration for about the extent of a sixpence.



## CHAPTER III.

## ON CASES, IN WHICH THE SYNOVIAL MEMBRANE HAS UNDERGONE A MORBID CHANGE OF STRUCTURE.

## SECTION I.

*Pathological Observations.*

THERE are some diseases, which consist simply in a morbid action; there are others, in which the morbid action produces a morbid change of anatomical structure.

Diseases of the latter class differ in their nature in different organs. Thus the tubercles, which affect the lungs in *phthisis pulmonalis*, are never met with in the breast: and cancer, which is frequent in the breast, never attacks the lungs, except by extending to them from the contiguous parts.

The disease, which I am about to describe in the present chapter, consists in a morbid alteration of structure, which takes place in the synovial membranes of joints, and which, as far as I have seen is peculiar to these parts. I have never known an instance of the same disease in the serous membranes, which so nearly resemble the former in their nature and functions; nor even in the synovial membranes, which constitute the bursæ mucosæ and sheaths of the tendons.

Several years since, in examining a diseased elbow, I found the cartilaginous surfaces completely destroyed by ulceration: an abscess had formed in the joint, and no remains were observable of the natural structure of the soft parts, these being everywhere converted into a pulpy substance, of a light brown color, and about one third of an inch in thickness. As the ravages of the disease were very extensive, it was impossible to determine, from the appearances on dissection, where the morbid action had originated. This case, however, differed materially from some others which I had met with, in which the destruction of the cartilages was not attended by any affection of the soft parts similar to that which has been described. The following cases, which have since occurred, furnish examples of the same disease in earlier stages of its progress, and show that it begins in the synovial membrane, and that the other parts become affected only in a secondary manner.

CASE XVII.—In a diseased knee, which was sent to me for examination by my friend the late Mr. Horn, surgeon to the Newcastle Infirmary, I found, in the cavity of the joint, about four ounces of a pale yellow fluid, having flakes of coagulated lymph floating in it. The synovial membrane, where it formed the loose folds, extending from one bone to the other; where it was reflected over the bones themselves, the crucial ligaments, and the fatty substance of the joint, had completely lost its natural appearance. It was converted into a pulpy substance, in most parts about a quarter, but in some parts, nearly

half an inch, in thickness, of a light brown color, intersected by white membranous lines, and with red spots formed by small vessels injected with their own blood. The synovial membrane on the edge of the cartilaginous surfaces had undergone a similar change of structure, but only for a small extent. The semilunar cartilages were entire, but in a great measure concealed by the pulpy substance projecting over them. The cartilages covering the bones, in a few places were in a state of incipient ulceration.

CASE XVIII.—Martha Manners, twenty-six years of age, was admitted into St. George's Hospital, on the 6th of March, 1813, on account of a disease in her right knee.

She said that in June, 1811, she first observed the joint to be swollen and stiff; and from this time, the swelling and stiffness increased; but, in the first instance, by very slow degrees. About Michaelmas, 1812, she caught cold, and the swelling increased more rapidly; but it was not attended with any considerable quantity of pain.

At the time of her admission into the hospital, the right knee measured about two inches in circumference more than the left. The swelling was elastic; prominent at the upper and lower part of the joint; not having the form of the articulating ends of the bones. The joint admitted of motion, but the leg could not be completely bent or extended on the thigh.

Various remedies were employed without the smallest benefit. The stiffness of the joint increased. About the middle of May, she began to experience considerable pain; and soon afterwards an abscess presented itself by the side of the ligament of the patella, which was opened on the 15th of June. The orifice made by the lancet healed in a few days; but she continued to suffer severe pain; her health became much affected, and on the 6th of August the limb was removed by amputation.

On examining the joint, about an ounce of thick matter was found in its cavity. The ligaments were in a natural state. The synovial membrane had undergone precisely the same alteration as in the case which has just been related. The only point of difference that could be observed was, that the whole of that portion of the membrane which is reflected over the cartilages had become affected, presenting the same appearance as elsewhere, but being thickened in a less degree. The cartilages had begun to ulcerate in a few spots; but the ulceration had made so little progress, that it might not have been noticed on a superficial inspection.

CASE XIX.—Samuel Langford, twenty-four years of age, was admitted into St. George's Hospital on the 22d of April, 1812.

At the time of his admission one of his knees was swollen to nearly twice its natural size. The swelling was prominent on the anterior and lower part of the thigh. It was soft and elastic, so that at first it appeared to contain fluid; but, on particular examination, the absence of fluid was ascertained by the want of fluctuation. The leg was kept in the half-bent state, and the joint admitted of only a very limited degree of motion. He had no pain, even when attempts were made to move the limb. The skin over the diseased part was of a pale color, with some dilated veins ramifying in it. On each side of the joint a small orifice was observed, through which the probe might be introduced into a sinus; but the sinuses appeared to be of small extent. His general health was unimpaired. He said that, two years ago, he first experienced some pain in the knee, but it was not sufficient to prevent his going about his usual occupations. Soon afterwards the joint began to swell, and the enlargement gradually increased from that period. Several abscesses had formed at different times; but the greater number of them had healed.



About two months after his admission into the hospital, the limb was amputated.

On dissecting the diseased joint, the ligaments were found in a perfectly natural state. The whole synovial membrane, except where it was reflected over the cartilages, was converted into a pulpy, elastic substance, of a brown color, intersected by white membranous lines, in some places half an inch in thickness, in others more; and in those parts where the membrane was reflected over the bones, near the border of the cartilages, it was destroyed in spots by ulceration.

The semilunar cartilages were in a natural state, but in a great measure concealed, in consequence of their being enveloped in the mass of substance formed by the diseased synovial membrane. The cartilaginous surfaces of the femur and patella were extensively, but not entirely, destroyed by ulceration; the ulceration being greatest towards the circumference. On the internal portion of the head of the tibia, the cartilage was destroyed only for a very small extent, the ulceration being entirely confined to the margin. On the external portion of the head of the tibia, the cartilage was absorbed to a greater extent. The bones possessed their natural structure and hardness. The cavity of the joint contained matter, and the sinuses communicated with it.

CASE XX.—Michael Purcel, sixteen years of age, was admitted into St. George's Hospital, on the 10th of July, 1811, on account of a disease in the right knee.

He said that, in the summer of 1807, he had received a blow on the inside of the joint. Some time afterwards a swelling formed and burst, and some fluid was discharged. In about a week the orifice healed; a slight degree of stiffness only remained and he was able to follow his usual occupations. He continued well till December, 1810, when the joint was observed to be increased in size. From this time the swelling increased, but with no other inconvenience than stiffness of the joint, and a slight degree of pain in walking.

At the time of his admission into the hospital there was a large swelling of the knee, extending an inch or more up the anterior part of the thigh under the extensor muscles. The swelling was more prominent in some parts than in others. It was soft and elastic, and gave to the hand an indistinct sensation, as if it contained fluid. The leg was kept in a half-bent position, and was nearly immovable on the thigh. He had no pain, except on motion or pressure.

On the 28th of November, an abscess burst on the outside of the joint, and discharged a small quantity of pus. After this other abscesses formed, and burst at various times. The swelling continued to increase. Amputation was performed on the 6th of April.

On dissecting the amputated joint, all the ligaments were found in a natural state. The synovial membrane had precisely the same appearance as in the last case. In some parts it was half an inch, in others more than an inch, in thickness. The cartilages were for the most part destroyed by ulceration, and carious\* surfaces of bone were exposed. The abscesses appeared to have formed in the substance of the synovial membrane, and did not communicate with the cavity of the joint, nor did the joint contain pus.

CASE XXI.—A boy, six years of age, was admitted into St. George's Hospital, in March, 1808, on account of a disease in one knee.

\* In using the term *caries*, on this and other occasions, I have considered it as synonymous with ulceration; or, at least, as expressing that state in bones, which corresponds to ulceration in soft parts. Some confusion has been produced in pathological nomenclature in consequence of this term having been employed by some to express, not only bone which is ulcerated, but that whose surface has been exposed from other causes.



The joint was larger than the natural size. The leg was bent at a right angle to the thigh, and admitted of no motion. The skin on the outside was ulcerated to a considerable extent. Various remedies having been employed without success, the limb was amputated on the 29th of April. On examining the joint, the synovial membrane was found to have undergone a morbid change of structure, similar to that in the preceding cases; but with this difference, that the pulpy substance into which it was converted projected into the joint, so as nearly to fill its cavity, and adhered to the cartilaginous surfaces. On making a longitudinal section of the joint, the cartilage covering the bones was seen, as a white line, about one-tenth of an inch in thickness, connected to the bone on one side, and having the pulpy substance adhering to it on the other. It was, therefore, thinner than natural; but otherwise entire, except at the posterior part of one of the condyles of the femur, where it was destroyed by ulceration for a small extent. There were no distinct remains of the ligaments external to the joint, and only some small vestiges of the crucial ligaments and semilunar cartilages.

CASE XXII.—John Dillemore, thirteen years of age, was admitted into St. George's Hospital, in the summer of 1812, on account of a disease in one knee. At that time the joint was slightly swollen and stiff, so as to admit of only a very limited degree of motion. He was free from pain. The swelling was elastic, without any perceptible fluctuation of fluid. These symptoms had been coming on gradually about two years previous to his admission. At this time he remained in the hospital for upwards of three months; and a great number of remedies, which it is unnecessary to enumerate, were employed without the smallest benefit.

On the 26th of January, 1814, he was re-admitted into the hospital. The affected knee was about two inches and a half in circumference more than the other. The swelling was elastic; it extended up the anterior and lower part of the thigh, as in cases of inflamed synovial membrane; but its form was less regular, being more prominent, and extending higher up on the outside than on the inside. The leg was kept in the half-bent position, and was perfectly immovable on the thigh. He was subject to occasional attacks of violent pain. He said, that the swelling had gradually increased from the period of his quitting the hospital, in 1812, but that he had not been subject to very severe pain till about six weeks previous to his re-admission. On the 31st of January the limb was amputated.

On examining the diseased joint, the synovial membrane was found converted into a pulpy substance of a light brown color, with red spots arising from vessels ramifying in it injected with their own blood, and intersected by very numerous membranous lines. On the outside of the joint, the diseased membrane was in some places nearly an inch in thickness. The membrane covering the cartilages in some parts was in a natural state; in other parts, it had undergone the same morbid change of structure as elsewhere. The cartilages were ulcerated in spots. There was about half an ounce of pus in the cavity of the joint; and there were two or three abscesses in the substance of the synovial membrane, not communicating with the joint, containing about the same quantity of purulent matter.

CASE XXIII.—William Hine, twenty-three years of age, was admitted into St. George's Hospital on the 12th of December, 1814, on account of a complaint in one of his knees. He said that, in the summer of 1812, he first observed a slight degree of stiffness and swelling of the joint, unattended by pain. At first the swelling was confined to the inside, but it gradually extended itself over the whole circumference of the joint. The

stiffness and swelling slowly, but uniformly, increased : and about the end of the year 1813, he began to experience considerable pain.

At the time of his admission, the knee was much swollen ; the swelling was irregular and most prominent on the inside ; it was soft and elastic, without the fluctuation of fluid. The patient complained of constant deep-seated, gnawing pain, which disturbed his sleep. He had a slight degree of hectic fever. On the 16th of December the limb was amputated.

On dissecting the amputated joint, the synovial membrane was found to have undergone the same morbid alteration of structure as in the last case. The cartilages were slightly ulcerated in a few spots.

CASE XXIV.—James Gould, sixty-five years of age, was admitted into St. George's Hospital, in May, 1814. One knee was swollen and stiff, admitting of scarcely any motion. The swelling was elastic. He complained of severe pain in the joint. Near the ligament of the patella was the orifice of a sinus communicating with the articular cavity, and discharging a very small quantity of pus. No clear history could be procured of the disease in its earlier stages ; but it appeared that he had been subject to repeated attacks of inflammation of the synovial membrane.

The limb was amputated on the 23d of May.

On dissection, the ligaments, bones, cartilages, and that portion of the synovial membrane which is reflected over the cartilages, were found to be in a natural state ; but the synovial membrane in other parts had undergone the same morbid alteration of structure as in the preceding cases.

These cases furnish examples for the same disease in different stages of its progress. The morbid action evidently originates in the synovial membrane, which loses its natural organization, and becomes converted into a thick pulpy substance of a light brown, and sometimes of a reddish-brown color, intersected by white membranous lines. As the disease advances, it involves all the parts of which the joint is composed, producing ulceration of the cartilages, caries of the bones, wasting of the ligaments, and abscesses in different places.

I have already remarked that this disease is peculiar to the synovial membranes ; at least, that I have never met with it in any other part of the body ; but it belongs to the same order with tubercles of the lungs, scirrhus of the breast, the medullary sarcoma or fungous hæmatodes of the testicle, and numerous other diseases, in which the natural structure of the affected organ is destroyed, and a new and different structure is added in its place. To these also it bears a near resemblance in its progress. Thus, tubercles of the lungs, in the first instance, occupy the vesicular and interlobular substance ; but ultimately they inflame and ulcerate ; abscesses form in them ; and then the pleura, the bronchia, and other contiguous parts, become effected. Similar circumstances mark the progress of other maladies of the same description.

The cases which have been related are not the only ones in which I have had the opportunity of tracing the same morbid appearances. I have also met with numerous others, in which the similarity of the history and symptoms, and the resemblance in the form and elasticity of the tumor, indicated the disease to be of the same nature, although I was not able to verify the fact by dissection. In every case, in which I have had it in my power to watch its progress, the complaint has advanced slowly, and sometimes has remained in an indolent state during a very long period : but ultimately it has always terminated in the destruction of the joint.

It is a remarkable circumstance, that this affection of the synovial



membrane is rarely met with except in the knee. I have never known an instance of it in the hip or shoulder.\* It is probable that the influence of the external cold may operate as one of the causes by which the disease is produced, and this explains, why it occurs frequently in the knee, and seldom in deep-seated articulations.†

It is evident from the history of cases in which a part of the living body has assumed a new and morbid structure, that this alteration seldom takes place except by slow degrees; and it would add much to the interest and utility of researches in morbid anatomy, if it were more frequently attempted to ascertain, what is the first change in the organization of the affected part which disease produces, and from thence to trace the gradual progress of the other changes which take place, until the destruction of the natural organization is completed. Whether the following case is to be considered as of the same kind with those already recorded, but in an earlier stage of the disease, cannot at present be determined; but it appears not improbable that it is so; and I shall venture to relate it, in this place, in the expectation that it may, at any rate, be of some service in assisting the investigations of future inquirers.

CASE XXV. — Belton, a boy eleven years of age, was admitted into St. George's Hospital, in August, 1810, on account of a disease in one knee.

There was but little pain in the joint: it was slightly enlarged, admitted of some motion, but not of complete flexion and extension. His parents said that the disease had begun about a year and a half before his admission into the hospital; that it had increased very slowly; and that he had never suffered from it any serious distress. Various remedies were employed without benefit; and in a short time his friends took him out of the hospital. A few weeks afterwards he died in consequence of an accumulation of water in the ventricles of the brain.

I obtained permission to examine the body.

The synovial membrane of the affected knee externally had its natural appearance. Internally it was lined by a straw-colored gelatinous substance, so intimately adhering to it, that it could not be detached, except by an artificial separation. The synovial membrane was encrusted in this manner every where, except on the cartilaginous surfaces. The gelatinous substance in general appeared about one eighth of an inch in thickness, but in some parts, near the borders of the cartilages, it was much thicker, so as to project considerably into the cavity of the joint. In a few places, towards the margin of the articulating surfaces, the cartilage had begun to ulcerate; in some of these it was entirely absorbed, so that the bone was exposed; but for the most part, there was only an irregular ulcerated surface towards the cavity of the joint; the remaining portion of the cartilage being entire, and having its natural adhesion to the bone.

The synovial membrane itself bore no marks of inflammation. In the substance with which it was lined, some vessels were observed ramifying, beautifully injected with their own blood; but these were few in number,

\* My friend Mr. Hodgson, surgeon to the hospital at Birmingham, informs me that he has met with one example of it in the ankle, and another in one of the joints of a finger.

† The account of the *fungous articuli*, which has been given by some German writers, appears to have been drawn, partly, from cases of the disease described in this chapter, partly, from cases of inflammation of the synovial membrane. Mr. Russel seems to have taken his history of the pathology of white-swelling in great measure from cases similar to those which have been related; but we must observe, that the term white-swelling has been applied, almost indiscriminately, to all the affections to which the joints are liable, and by no means confined to that under our present consideration.



and only in certain parts. This substance differed in appearance from the coagulated lymph which is found on the surface of an inflamed membrane; and we may presume, therefore, that the effusion of it was the result, not of inflammation, but of some other morbid action.

## SECTION II.

### *On the Symptoms of this Disease.*

This disease generally takes place in persons who are not much above the age of puberty. I do not recollect more than one instance of it having occurred after the middle period of life. In general it can be traced to no evident cause, but occasionally it is the consequence of repeated attacks of inflammation. In this respect it resembles other diseases of the same order. Inflammation of the lungs may lay the foundation of tubercles, and inflammation of the breast may occasion the growth of a scirrhus tumor. Where I have had an opportunity of examining the morbid appearances after amputation, I have always found the whole, or nearly the whole, of the synovial membrane affected by the disease; but it is probable, that if the examinations were made at an earlier period, we should often find the morbid change originating in some one point. At least this is in conformity to what we find in other maladies, which correspond to this in their nature: and in one instance, in a girl who labored under this affection, and who died of a fever, I found one half of the synovial membrane altered in structure, and the other half retaining its natural appearance.

In the origin of this disease, there is a slight degree of stiffness and tumefaction, without pain, and producing only the most trifling inconvenience. These symptoms gradually increase. In the greater number of cases, the joint at last scarcely admits of the smallest motion, but, in a few cases, it always retains a certain degree of mobility. The form of the swelling bears some resemblance to that in cases of inflammation of the synovial membrane, but it is less regular. The swelling is soft and elastic, and gives to the hand a sensation as if it contained fluid. If only one hand be employed in making the examination, the deception may be complete, and the most experienced surgeon may be led to suppose that there is fluid in the joint, when there is none; but if both hands be employed, one on each side, the absence of fluid is distinguished by the want of fluctuation.

The patient experiences little or no pain, until abscesses begin to form, and the cartilages ulcerate; and even then the pain is in many instances not so severe as where the ulceration of the cartilages occurs as a primary disease; and the abscesses heal more readily, and discharge a smaller quantity of pus, than in cases of this last description. At this period the patient becomes affected with hectic fever; loses his flesh, and gradually sinks, unless the limb be removed by an operation.

The progress of this disease varies in different cases. In general, one or two years elapse before it reaches its most advanced stage; but sometimes the period is much longer; and occasionally it becomes indolent, so that it remains during many months without any sensible alteration. In like manner, tubercles of the lungs, or scirrhus of the breast, in some instances, remain in an inactive state for several months, or even for one or two years.

The diagnosis of this disease is seldom difficult. The gradual progress of

the enlargement and stiffness of the joint without pain, and the soft elastic swelling without fluctuation, in the majority of cases, enable us to distinguish it readily from all the other morbid affections to which the joints are liable.

The cases with which those of this disease are most liable to be confounded, are those of chronic inflammation of the synovial membrane.

1st, When the synovial membrane has undergone a morbid change of structure, it occasionally happens that a preternatural secretion of fluid takes place at the same time from its inner surface ; and the joint becomes distended, not with synovia, but with a turbid serum, having flakes of coagulated lymph floating in it, which causes the tumor to present nearly the same external characters as where the synovial membrane is inflamed. But here the swelling will not yield to that treatment, under which it would be speedily reduced if it depended on simple inflammation ; and attention to this circumstance, joined with an accurate previous history, will enable us to recognise the real nature of the disease.

2dly, When the synovial membrane, after inflammation has subsided, has been left in a thickened state, and coagulated lymph has been effused into the articular cavity, the tumor, in some instances, a good deal resembles the tumor which occurs in cases of this disease ; so much so, that it will be very difficult to give a correct opinion, merely from observing the present appearance and condition of the joint. The surgeon must in great measure form his judgment from the account which he receives of the origin and early symptoms of the complaint ; or, when an accurate statement cannot be procured, by waiting to observe its future progress.

### SECTION III.

#### *On the Treatment.*

When a part is swollen and rigid in consequence of inflammation, the swelling and rigidity may often be dispersed ; but I know of no instance in which an organ having completely lost its natural structure is capable of having that structure restored. Physicians and surgeons have been employed, during successive ages, in endeavoring to discover a cure for tubercles of the lungs, and cancer of the breast, and the result of their labor is only to prove that these diseases are incurable. Analogy, therefore, would not lead us to be sanguine as to the discovery of a remedy for this affection of the synovial membrane, and experience demonstrates that it is equally incurable with other maladies of the same order. It would be needless for me to occupy the time of my readers by a detail of the various remedies which I have tried, or seen tried by others, in cases of this description ; since the general result of these trials was only to lead to the above conclusion. By means of rest and cold lotions, the progress of the disease may be somewhat checked, as the suppuration of tuberculated lungs may be retarded by occasional bleeding, and a milder climate. Where there is considerable pain in consequence of the cartilages having begun to ulcerate, some benefit is derived from the use of warm fomentations and poultices. But no method, with which I am acquainted, is capable of doing more than somewhat checking the progress, and somewhat relieving the symptoms of the complaint. In every case of which I have had an opportunity of seeing the termination, the ulceration of the cartilages, the formation of abscesses in the cavity of the joint, and the consequent disturbance of the

patient's general health, have ultimately rendered the amputation of the limb necessary, in order to preserve the patient's life. At this period, therefore, the surgeon is called upon to recommend and urge an operation ; but at an earlier period, it is a matter of choice with the patient, whether he will live with the incumbrance of an useless limb, till the advanced stage of the disease renders its removal indispensable, or whether he will submit to the loss of it, before the absolute necessity for losing it exists.



## CHAPTER IV.

## ON THE ULCERATION OF THE ARTICULAR CARTILAGES.

## SECTION I.

*Pathological Observations.*

It has been taught by some anatomists, that the articular cartilages are not endowed with vascularity; and that, when there is an appearance of their having been destroyed by ulceration, this must really have been effected, not by the action of vessels in the cartilages themselves, but by that of the vessels of the other parts, with which they are connected, or with which they come in contact. Various circumstances, however, seem to be in contradiction to these opinions.

Up to the period of growth being concluded, we must suppose the articular cartilages to be vascular, otherwise we cannot account for the changes of bulk and figure which mark their progress towards complete development. In the child, canals or sinuses may be seen ramifying through their substance, containing blood, and manifestly intended to answer the purposes, though not constructed with the distinct tunics, of ordinary blood-vessels.

In the adult person these canals for the distribution of blood, are not perceptible. This proves that they are very minute, but not that they are altogether wanting. 1. In the transparent cornea of the eye no vascular structure can be detected under ordinary circumstances; but the existence of vessels in the cornea is proved by the changes which it undergoes in disease; and when it is inflamed, such vessels become distinctly visible, injected with red blood. So we meet with occasional, though rare instances, of vessels containing red blood extending from a diseased bone into the cartilage covering it. A case, in which this appearance was observed, will be mentioned in the next chapter. 2. The cartilages of joints are subject to the constant and powerful operation of friction, yet they are not affected by it. They continue as thick and as perfect in those who are unremittingly engaged in bodily exercise, as in the most inactive persons. The cartilages of the knee and ankle are exposed to friction at least as much as the hard enamel and ivory of the teeth; yet we often see persons in whom the latter are much worn away, while the former remain entire. These circumstances cannot be explained, unless we admit the cartilages to possess a power of reparation; and this must be supposed to depend, as in other textures, on the action of blood-vessels modified by that of the absorbents. 3. We find occasionally some portion of the cartilage covering the articular extremity of a bone altered from its natural organization, converted into a number of ligamentous fibres, each of which

is connected by one extremity to the bone, while the other is loose towards the cavity of the joint. Here is a morbid alteration of structure, the occurrence of which seems to indicate that there must be such a vascular apparatus entering into the formation of cartilage as enables new materials to be deposited, and old materials to be absorbed, and without which morbid alterations of structure do not take place in other parts of the body.

In some of the cases related in the former chapters, the cartilage covering the articular cartilage had been removed for some extent on the surface towards the cavity of the joint, while that portion of it which was connected to the bone remained entire, and retained its natural structure. In the two following cases, the same thing was observed to a very great extent; and this superficial abrasion had taken place in many parts in which cartilage was in contact with cartilage, and where, therefore, it was impossible to attribute it to the operation of vessels belonging to any of the neighboring textures.

CASE XXVI.—A boy, twelve years of age, on the 28th of June, 1809, fell from a height, and pitched on one of his knees. When he was brought to the hospital, he was found to have a compound fracture of the femur. For some days he appeared to go on well; but afterwards an abscess formed in the thigh, extending as high as the nates; and he sunk and died on the 21st of July. On examining the knee-joint after death, the cartilage covering the condyles of the femur, and that covering the head of the tibia, were found, in some parts, entirely absorbed, so that the bone was exposed; and in other parts it was absorbed on the surface towards the cavity of the joint, while the layer of it next to the bone retained its natural adhesion, and its natural structure. The cartilage, in these parts, was formed into grooves, having an appearance as if the greater portion of its substance had been removed with a chisel. There was no purulent, nor other effusion, into the cavity of the joint.

CASE XXVII.—A middle-aged man met with an injury of the knee, which was followed by inflammation and suppuration, and he died in St. George's Hospital on the 30th of August, 1809.

On examining the joint after death, the cartilage covering the condyles of the femur, and the head of the tibia, was found entirely destroyed towards the circumference, so that the bone was exposed. Elsewhere, only a thin layer of cartilage remained; but this had its ordinary texture, and adhered as firmly as usual to the bone.

I conceive that the foregoing cases, and the other facts which have been stated, are sufficient to prove that the articular cartilages may be absorbed or ulcerated from the action of their own vessels, and that the ulceration may begin, and frequently does begin, on that surface which is towards the articular cavity. At the same time, it is to be observed, that in many instances the ulceration begins in another situation; and I have frequently seen the cartilage abraded where it had been in contact with the bone; while on the surface, towards the cavity of the joint, it remained smooth and perfect. Under these circumstances, the space formed by the absorption of the cartilage becomes filled up by a vascular substance, resembling granulations, and uniting the bone and cartilage to each other.

In whatever way the ulceration of the articular cartilage is produced, there is this remarkable difference between it and the ulceration of soft parts: suppuration seldom takes place while the ulcer of the cartilage is small; and often the disease proceeds so far as to cause caries of the bones to a great extent, without matter being formed in the joint. This circumstance is deserving of notice. It has long been established, that suppuration may take place



without ulceration; and it appears that in this instance ulceration occurs without the formation of pus.

Ulceration of the articular cartilages may arise from various causes, the principal of which are as follows:—

1st, It may be the consequence of disease originating in the neighboring soft parts, especially of inflammation of the synovial membrane; examples of which will be found among the cases related in the preceding chapters.

2dly, It may depend on a morbid condition of the cartilage itself; or,

3dly, On a chronic inflammation of the surface or substance of the bone with which it is connected.

4thly, It may be the result of a peculiar alteration in the condition of the cancellous structure of the bones, which is met with in young scrophulous persons.

This last form of the disease requires to be considered separately, and will constitute the subject of the next chapter. The observations which I have to offer at present will relate to ulceration of the cartilages occurring under other circumstances, but especially to those cases in which the disease has originated, either in the cartilage itself, or in the surface of bone with which it is connected.

CASE XXVIII.—In examining a body brought into the dissecting-room in Windmill-street, I found the cartilage in a diseased state, in the joints of both hips, of one of the knees, and of both elbows. In some spots, the cartilages of these joints were altogether destroyed by ulceration, and carious surfaces of bone were exposed; in others, the cartilage was not completely absorbed, but it had the appearance of fibres, which were connected at one extremity to the bone, while the other extremity was loose towards the cavity of the joint, and having no lateral connection with each other. The intervertebral cartilages connecting the bodies of some of the dorsal vertebræ were also in a diseased state. They retained the usual appearance of concentric layers towards the circumference; but in the centre, instead of the white semi-fluid substance, which is met with under ordinary circumstances, they were found to be of a brown color, of a solid and somewhat brittle texture, composed of several portions, having a very slight adhesion to each other. The ligaments, the synovial membranes, and the bones, were all in a natural state, except that the latter were occasionally carious, in consequence of the absorption of the cartilage; but the caries was unattended by the formation of matter.

In this case, the original disease appears to have been a morbid state, and subsequent ulceration of the cartilages. It shows that where the disposition to it exists, the destruction of the cartilage may take place in several joints at the same time; and I have observed the same thing in other instances.

The conversion of the cartilage into a soft fibrous structure has been already noticed. I am disposed to believe that it is the frequent, though not the constant, forerunner of ulceration. In a woman, who died a week after a severe contusion of the hip, the cartilage of the head of the femur was found in some parts entirely absorbed, in others having a fibrous appearance, similar to what has been described; and I have noticed the same circumstances in other cases, sometimes connected with, and sometimes independent of local injury.

CASE XXIX.—A girl, seven years of age, was admitted into St. George's Hospital, in May, 1809, on account of a complaint in the left hip. She had pain in the knee, the limb was shorter than is natural, and the nates were wasted and flattened. An issue was made with caustic, behind the great trochanter. Soon after her admission an abscess burst near the crista of the



ilium. The disease in the hip appeared to be considerably relieved ; but, on the 1st of August, she died of an accidental attack of erysipelas.

On inspecting the body, the glutæi muscles of the left side were found wasted, and of a dark color. A sinus extended from the external orifice of the abscess through the soft parts, and communicated with the hip-joint, by an ulcerated opening in the margin of the acetabulum.

There were no remains of cartilage on the surface of the acetabulum. The exposed bone was in a carious state, and of a dark color, and the cavity of the acetabulum was rendered deeper and wider than is usual. The greater part of the cartilage was destroyed on the head of the femur, and the small portion of it which remained was readily separated from the bone. This circumstance is often met with, where cartilage is undergoing the process of ulceration.

The capsular ligament was somewhat thicker than under natural circumstances, and more connected with the surrounding parts. There were no remains of the round ligament.

In the anterior part of the joint, a quantity of organised soft substance, resembling that of adhesions, was interposed between the head of the femur and the acetabulum, and behind this was a collection of dark-colored pus. From these two causes the head of the femur had been separated from the os innominatum, and pushed outwards, and it had afterwards been drawn upwards by the action of the muscles, so that it was lodged on the superior part of the bony margin of the acetabulum. The synovial membrane was of a dark color, but not otherwise diseased.

On examining the hip of the opposite side, I found the soft parts external to it, the capsular ligament, synovial membrane, and fatty substance of the joint, having no appearance of disease. The cavity of the joint contained about a dram of dark-colored pus. The cartilage was absorbed from about one third of the surface of the acetabulum. The exposed bone in most parts presented an uniform compact surface, but in two places it was in a state of superficial caries. In some parts of the head of the femur, the cartilage had a fibrous appearance, similar to what has been already described ; in other parts it was entirely absorbed, and a carious surface of bone was exposed ; and elsewhere it was in a natural state. The round ligament was ruptured by a very slight degree of force, which seemed to arise from the cartilage having been destroyed round its insertion into the acetabulum.

The bones in the neighborhood of the carious surfaces of the left hip were of a darker color than usual ; but no such appearance was observed in the bones of the other hip, which were in all respects in a healthy state.

CASE XXX.—John Catnack, forty-four years of age, was admitted into St. George's Hospital on the 29th of September, 1813, with pains in the lower limb of the right side, extending from the hip to the knee, and resembling the pains of rheumatism. He attributed these pains to his having caught cold about a month before his admission. He labored also under a complaint of his bowels, of which he died on the 4th of December. On dissection, no preternatural appearances were discovered, except in the right hip. The capsular ligament and synovial membrane were in a natural state. The cartilages covering the head of the femur, and lining the bottom of the acetabulum, were destroyed by ulceration, for about one half of their extent, and wherever the cartilage was destroyed, an ulcerated surface of bone was exposed. The round ligament was readily torn in consequence of ulceration having extended to it at the part where it was inserted into the acetabulum. The bones possessed their natural texture and hardness. There was no pus in the joint. It

was observed, that the ulcerated surface of the acetabulum corresponded to that of the femur, these surfaces being exactly in contact, in the position in which the patient had remained since his admission into the hospital.

CASE XXXI.—William Bridges, twenty-one years of age, was admitted into St. George's Hospital, on the 28th of November, 1810. He gave the following account of his complaint:—About the middle of the May preceding, he first experienced a pain in the right knee, which was aggravated by walking. At the end of a month, the pain became so severe that he was under the necessity of being confined to his bed. He had slight pain in the hip; but that in the knee was intense, keeping him awake at night. An abscess formed, which, in the September following, burst on the inside of the thigh.

At the time of his admission, the nates were wasted and flattened; the limb on the affected side appeared to be an inch and a half longer than the other; there was a large abscess in the posterior part of the thigh. He was emaciated, and labored under a hectic fever. An issue was made with caustic, behind the great trochanter of the femur, and afterwards a second issue was made in the same manner on the anterior edge of the *tensor vaginæ femoris* muscle. Under this treatment, he experienced for a time great relief, notwithstanding several abscesses formed and burst in different parts of the thigh. He became free from pain; regained his flesh; the hectic fever abated, and the discharge from the abscesses was much lessened. The limb now appeared to be shorter than the other. He continued to mend till the middle of February, 1811. At this period the former bad symptoms began to return. He was affected with a constant diarrhœa, and profuse perspirations, and he died on the 26th of March following.

On inspecting the body, the glutæi muscles were found wasted and shrunk, and in many parts their texture was destroyed by the abscesses, which communicated with the cavity of the joint by two ulcerated openings, one on the anterior and the other on the posterior part. The abscesses formed several sinuses in the neighborhood of the joint, and the capsular ligament was in consequence connected to, and in some measure blended with, the other soft parts.

The joint contained purulent matter. The synovial membrane was darker than natural, but otherwise had the ordinary appearance. There were no remains of the round ligament. The cartilages were everywhere absorbed, and the exposed surfaces of bone were in a carious state. The head of the femur was reduced to about two thirds of its original size; and the acetabulum was rendered deeper and wider, nearly in the same proportion. At the bottom of the acetabulum there was an ulcerated opening, just large enough to admit a common probe, communicating with an abscess within the pelvis. The carious surfaces of the bones had the same dark color and fetid smell as in other cases of caries; but otherwise they did not differ from healthy bones.

CASE XXXII.—Jemima Holloway, about twenty-three years of age, was admitted into St. George's Hospital on the 30th of March, 1814, on account of a disease of the right hip. There was a large abscess in the neighborhood of the hip, and the nates were wasted and flattened. She said that the disease had been going on for some years. On the 6th of June following her admission, she died.

On dissection, the glutæi muscles were found wasted and flabby, and of a pale color.

There was a large abscess of the nates communicating with the hip, by means of an opening in the posterior part of the capsular ligament and synovial membrane. In other respects the synovial membrane and capsular ligament were in a perfectly natural state.



The cartilages covering the head of the femur and lining the bottom of the acetabulum were destroyed by ulceration. The ulceration had extended to the bones, so that the head of the femur was not more than half, and the acetabulum was double, the usual size. The bones possessed their natural texture and hardness. There was an ulcerated opening at the bottom of the acetabulum, communicating with the inside of the pelvis.

CASE XXXIII.—Phœbe Harper, twenty-four years of age, was admitted into St. George's Hospital on the 29th of August, 1825.

About two months previous to her admission she had been seized, while employed in hay-making, with an excruciating pain in the lower limb of the left side.

It subsided sufficiently to allow her to walk home, but on the following day it returned, and it was now referred particularly to the groin. Leeches, blisters, &c. were applied, but the pain continued very severe.

At the time of her being admitted into the hospital she was unable to move the limb: the foot was turned outwards; and every attempt to press the head of the femur against the surface of the acetabulum, as well as all pressure in the neighborhood of the hip-joint, occasioned violent pain, so as to make the patient scream. The whole limb was hotter than natural; pulse between 90 and 100.

Altogether the disturbance of the constitution was greater than might be expected from such a local complaint.

October 24th, the patient died. On dissection, it was found that no effusion, either of serum, or lymph, or pus, had taken place into the cavity of the hip joint.

The synovial membrane was somewhat more vascular than usual, but the increased vascularity seemed scarcely to amount to inflammation. The cartilage covering the head of the femur had been destroyed by ulceration for more than half its extent; so as to expose the cancellous structure of the bone.

The remaining portion of the cartilage covering the head of the femur was thinner than natural: but this was more observable in some parts than in others. Every where the loss of substance appeared to be on the surface towards the cavity of the joint; the layer of cartilage towards the bone being unaltered, except in one spot, where it was ulcerated to a very small extent.

The cartilage of the acetabulum was entirely destroyed, so that every where a carious surface of bone was exposed.

There were no remains of the round ligament.

The synovial membrane on one part of the neck of the femur was destroyed by ulceration; and here also a carious surface of bone was exposed.

The bones themselves had their natural structure and hardness, not differing from healthy bones, except on the carious or ulcerated surfaces.

I could add to the foregoing an account of the dissection of several other cases, in which the hip was affected with the same disease; but, in doing so, I should only occupy the reader's attention unnecessarily. It will be sufficient to observe that,—

1. In the most advanced stage of the disease, none of the parts entering into the composition of the joint retain their natural structure. The soft parts are blended into a confused mass. Sometimes the head of the femur is completely destroyed, and there remains only the neck, or a portion of the neck, of that bone. Often the projecting margin of the acetabulum is entirely absorbed; so that, instead of a cavity, there is a broad carious surface of the *os innominatum*. In a few instances, a portion of the carious bone is found dead, and undergoing the process of exfoliation, or having already exfoliated into the cavity of the joint.



2. In whatever period of the disease the examination is made, the cartilages are found in a state of ulceration; but the morbid affections of the soft parts and bones vary very much: nor are they much altered from their natural state, except in the most advanced stage of the malady.

From these circumstances, and from the appearances in several of the cases which have been related, in which the disease was found in its incipient stage, and wholly confined to the cartilages and bony surfaces with which the cartilages are in contact, we may conclude that, in a large proportion of cases of caries of the hip, these are the parts primarily affected, and the following may be stated to be the progress of the disease:—

1. Ulceration takes place in the cartilages; generally in that of the acetabulum first, and in that of the head of the femur afterwards: sometimes it begins in both at the same time.

2. The ulceration extends to the bones, which become carious; the head of the femur is diminished in size, and the acetabulum is rendered deeper and wider.

3. Abscess forms in the joint; which after some time makes its way, by ulceration, through the synovial membrane and capsular ligament, into the thigh or nates, or even through the bottom of the acetabulum, into the pelvis. Sir Astley Cooper has shown me two specimens, in each of which an abscess connected with a diseased hip had burst into the rectum.

4. In consequence of the abscess, the synovial membrane and capsular ligament become inflamed and thickened. The muscles are altered in structure; sinuses are formed in various parts; and, at last, all the soft parts are blended together into one confused mass, resembling the parietes of an ordinary abscess.

In giving this statement, it is not my intention to assert that the hip is not liable to other morbid affections. I have in a former part of this work described the symptoms produced by inflammation of the synovial membrane of this joint. In the next chapter I shall point out another order of cases, in which the hip is affected in consequence of a scrophulous disease originating in the bones themselves: but still the conclusion remains that, in a great, and, I believe, in the greater, number of those cases to which the name of “diseased hip” has been usually applied, the ulceration of the cartilages is the primary affection, and the other parts in and near the joint become affected only in a secondary manner.

As, from the peculiar situation and connections of the hip, diseases of this part are attended with particularly serious consequences, I trust that the foregoing account will not be considered as given too much in detail, especially as it will prevent the necessity of entering with much minuteness into the history of the ulceration of the cartilages of other joints, in which the progress of the disease, allowance being made for the difference of structure and situation, is the same as in the hip.

CASE XXXIV.—David Martin, twenty-six years of age, was admitted into St. George's Hospital, on the 25th of July, 1810, on account of a disease in his right knee. He attributed it to a blow, which he had received some years previous; but he said, that the symptoms had all been much aggravated within the last six months. At the time of his admission into the hospital, the knee had the appearance of being swollen; but, on examination, this was found to arise from the wasting of the muscles, rather than from actual enlargement. The leg was fixed, or nearly so, in the half-bent position. The condyles of the femur projected beyond the head of the tibia. He complained of pain, which was particularly severe at night. An issue

was made with caustic on each side of the patella; but the symptoms were not relieved, and an abscess burst on the outside of the joint, discharging a large quantity of matter.

Soon after his admission, he experienced, for the first time, severe pain in the other knee; but this was unattended by swelling, or any alteration in the form of the joint, and the leg admitted of complete extension and flexion on the thigh. The pain continued, but no swelling ever took place.

In the beginning of September, he was seized with an accidental attack of erysipelas. Abscesses formed in different parts of the leg and thigh; and he gradually sunk, and died on the 7th of November.

On inspecting the body, the right leg was found bent so as to form a right angle with the thigh. The head of the tibia had been drawn towards the ham by the action of the flexor muscles, so that the condyles of the femur were unusually protuberant. The lateral ligaments were in a natural state. There were no remains of the crucial ligaments, or semi-lunar cartilages. The cartilages of the tibia, femur, and patella had been entirely absorbed. The bones were carious on their exposed surfaces, but not otherwise diseased. The synovial membrane was free from all morbid appearances, except at the points of its attachment to the bones; where, in a few places, coagulated lymph had been effused on its surface.

The left knee, externally, had its natural appearance with respect both to form and size. The leg admitted of complete flexion and extension. On dissection, the ligaments and synovial membrane were found in a perfectly healthy state; but about one third of the cartilaginous surfaces of the tibia and femur was destroyed by ulceration, the ulceration having taken place principally, but not entirely, near the circumference. The cartilage of the patella and the semi-lunar cartilages were entire; but the latter in some parts, were softer than usual. The bones were free from disease. There was no pus or other fluid in the joint.

The dissection of this case, in which the ulceration of the cartilaginous surfaces was evidently the primary disease, explains well the nature of, at least, many cases of that species of white-swelling, which some authors have described; in which there is long-continued and severe pain in the joint, before any tumor is observable.

CASE XXXV.—William Bowles, eighteen years of age, was admitted into St. George's Hospital, on the 1st of December, 1810. He said that, about eleven months previous to his admission, he had been seized with pain in his right knee, which was so severe as to keep him frequently awake at night. Six weeks after the pain attacked him, the joint for the first time became swollen. He now applied to a practitioner; under whose treatment, joined with perfect rest, the pain and swelling subsided, so that he was able to walk about. In the September following, having returned to his usual occupations, and used the joint a good deal, the pain and swelling returned.

At the time of his admission, the affected knee was about an inch and a half in circumference larger than the other. The swelling had the form of the articulating ends of the bones. The leg was half bent, and all attempts to give it motion gave great uneasiness. The pain which he experienced was great at all times, but particularly at night, when it very much disturbed his rest.

Soon after his admission, an abscess was discovered on the outside of the knee, which burst in the beginning of February, and discharged a large quantity of matter. On the 18th of March, the limb was removed by amputation.

On examining the joint the greater part of the cartilaginous surfaces of the



tibia, femur, and patella were found destroyed by ulceration. Where the cartilage was destroyed, the exposed bone was carious, and in some places covered by a thin layer of coagulated lymph; but in other respects the bone was free from disease. There were scarcely any remains of the semi-lunar cartilages. The joint contained pus, and the abscess in the joint had made its way into the external parts, through an ulcerated opening in the synovial membrane. The synovial membrane was in a natural state, except that, in a few places, there was a thin layer of coagulated lymph on its surface, which evidently had been recently effused. The external lateral ligament was destroyed by the abscess; the other ligaments were entire.

In this case, the principal disease observed in the dissection, was the ulcerated state of the cartilages. There was no affection of the synovial membrane beyond what might be considered as arising from the formation of pus in the joint, and the bursting of the abscess externally. Where inflammation of this membrane is the primary disease, swelling takes place often in a few hours, always within two or three days from the beginning of the attack; whereas in this instance, the constant answer which the patient gave to the repeated inquiries made of him, was, that he had had violent pain for six weeks before the joint was observed to be enlarged. From all these circumstances, we may conclude that, in this case, as well as in the last, the cartilages were the original seat of the disease, and that the morbid appearances observed in the soft parts were the consequence of the formation of the abscess in the joint.

The same conclusion may be drawn respecting the cases which follow.

CASE XXXVI.—Mary Anderson, twenty-eight years of age, was admitted into St. George's Hospital, on the 6th of April, 1815.

At this time, she complained of intense pain in the right knee, which was particularly severe at night, so as exceedingly to interrupt her rest. The pain was referred principally to the head of the tibia. There was a slight swelling of the joint, having the form of the articulating ends of the bones, and not giving to the hand the smallest sense of fluctuation. The leg admitted of being moved on the thigh, but all motion aggravated the pain.

No more particular account of the previous history of the case could be procured than the following:—that she had labored under pains of the right knee for nearly six years which had been occasionally relieved; and that, in the first instance, the pain had been unattended by swelling.

Immediately on her admission, an issue was made with caustic, on each side of the patella. On the 9th of April the pain had very much abated. The issues were kept open by the occasional application of caustic; and the pains very soon left her, and the swelling diminished.

About the 8th of June, she began to experience a return of the pains in the knee, and in the course of four or five days they were so severe as to keep her awake at night. There were convulsive startings of the limb, and the joint was swollen in a greater degree than formerly. The pains increased in violence, and her health began to suffer considerably. On the 3d of July the limb was amputated.

On examining the knee, some lymph and serum were found effused into the cellular membrane external to it.

The cavity of the joint contained about half an ounce of thin purulent fluid; the cartilage covering the patella was, in some parts, in a natural state; in others, it had the fibrous structure, which I have described in a former part of this chapter; and, in others, it was completely destroyed by ulceration, so as to expose the surface of the bone. The cartilage covering the articula-



ting extremity of the femur presented the same variety of appearances. On the inside there was a spot of some extent, which, instead of cartilage, was covered by a kind of membrane, resembling the substance of adhesions, but somewhat more dense in its structure; as if the cartilage had been formerly destroyed at this part, and coagulated lymph had been effused on the ulcerated surface of bone, which had afterwards become organized.

The cartilages of the tibia were ulcerated for a very small extent.

The synovial membrane in general was in a natural state. In some places it was slightly inflamed. On the outside of the joint, it was inflamed in a greater degree than elsewhere, and thickened, and had begun to ulcerate evidently in consequence of the abscess in the joint having begun to make its way to the external surface.

The bones possessed their natural texture and hardness.

CASE XXXVII.—Jane Bannister, forty years of age, was admitted into St. George's Hospital, in September, 1810, on account of a disease in her right foot. She gave the following account of her case:—

In the September of the preceding year she wrenched her instep, and soon afterwards experienced violent pain in this part, so that she was unable to stand on that foot, and her rest was much disturbed at night. The pain continued very severe, and, at the end of four months she observed, for the first time, a slight swelling on the inside of the foot. This was occasioned by an abscess, which was opened by her medical attendant in the April following.

At the time of her admission into the hospital the whole foot was swollen, and she complained of violent pain in it. The abscess continued open, discharging a small quantity of pus. On introducing a probe into the orifice, an exposed surface of bone was felt. Several applications were made without benefit, and the leg was amputated on the 25th of February, 1811.

On examining the amputated foot the cartilages of the joint formed by the astragalus and os navicular were found destroyed by ulceration, and a portion of the astragalus was dead, and undergoing the process of exfoliation. The cartilages of the joints formed by the cuneiform bones with each other, with the os naviculare, and with the metatarsal bones, were in like manner destroyed, and the exposed surface of bone were carious. The abscess communicated with the carious joints. The ligaments and synovial membrane were in a natural state, except in a few spots, where they were destroyed by the abscess. The bones possessed their natural texture and hardness. The cellular membrane of the foot contained coagulated lymph and serum.

CASE XXXVIII.—Thomas Herbert, fifty-eight years of age, was admitted into St. George's Hospital on the 14th of September 1825.

He complained of pain and tenderness of the left knee. The leg was kept in the half-bent posture; and there was a severe aggravation of the pain on every attempt to move it. There was a slight swelling of the joint, not arising from fluid collected in its cavity, but from an effusion into the cellular texture external to it. The man was in ill-health, and his memory was impaired, so that no history of his case could be procured.

Blisters were applied and kept open; but notwithstanding these remedies, joined with a state of complete repose, an abscess presented itself on the outside of the joint, and burst, discharging a large quantity of pus. It now became a question whether the limb should not be removed by amputation; but an attack of erysipelas prevented the operation. The patient gradually became more exhausted, and died in the beginning of December.

On dissection, the cartilage of the patella of the left knee was found in some parts destroyed, so as to expose the surface of the bone ; while in other parts it had lost its natural structure, and was converted into a fibrous substance.

The cartilages of the head of the tibia and condyles of the femur, were almost every where destroyed, so that extensive surfaces of carious bone were exposed.

The abscess did not communicate with the general cavity of the joint, but was limited to the portion of it formed by the external condyle of the femur and the external articulating surface of the tibia ; and here the cancellous structure of the bones adjoining the ulcerated surfaces was of a dark color. Every where else the bones belonging to the diseased joint retained their natural texture and hardness.

In the right knee, which had been supposed, while the patient lived, to be free from disease, the cartilage of the patella had, in some parts, entirely disappeared, so that the bone had become exposed; in other parts, it was converted into a fibrous substance; and in other parts, it retained its natural structure and appearance.

The cartilages of the femur and tibia of the right knee were somewhat thinner than natural, and of a yellowish-white color ; but they were entire, except on the edge of one of the condyles of the femur, where the cartilage was in a state of incipient ulceration, and the surface of the bone was of a red color in a spot about one third of an inch in diameter. The synovial membrane was in a natural state.

The following case affords an example of ulceration of the articular cartilages occurring as a secondary disease, the primary disease having had the character of a rheumatic inflammation of the bone and periosteum. I have seen a few other cases apparently similar to this, but in which no opportunity occurred of ascertaining the exact nature of the disease by dissection. The history of one of these will be found among the cases related hereafter.

CASE XXXIX.—Sarah Holder, twenty-two years of age, was admitted into St. George's Hospital, on the 26th of July, 1827, with a diffused swelling extending from the upper part of the right thigh to the leg, a little below the knee. The swelling was most conspicuous in the immediate neighborhood of the knee-joint ; and from thence gradually became diminished, having no defined termination either above or below. It was somewhat elastic, the skin over it appearing glossy and tense, but not redder than natural. The patient complained of exquisite pain, especially on pressure. The pain was also aggravated by every motion of the knee; nevertheless it was principally referred, not to the joint itself, but to the thigh-bone immediately above it. In addition to these local symptoms, the pulse was frequent; the tongue furred, and rather brown; the skin hot; and the countenance anxious and expressive of much suffering. The condition of the patient was altogether a good deal similar to that which might be produced by severe rheumatic inflammation of the bone and periosteum; and the history of the case seemed to justify the opinion that such was the nature of the disease, as the symptoms had begun without any precursory rigor on the day previous to her admission, and had been preceded, for an entire month, by rheumatic pains in the elbows and shoulders.

Saline and antimonial medicines were exhibited; leeches were freely applied to the limb, and on the 28th of July, a pill, containing two grains of calomel and half a grain of opium, was exhibited twice daily. Under this treatment the gums became slightly affected, and the symptoms gradually abated. On the 3d of August, the mercurial pill was given only once daily;



and, in the course of a few days more, it was altogether discontinued, blisters being at the same time applied to the limb.

August 13. The swelling and pain had entirely left the upper part of the thigh; but there were still some remains of both in the immediate neighborhood of the knee. Altogether, she was in a much better state with respect to the local symptoms, and the general health was improving.

August 15. After an accidental exposure to cold, she had a rigor, followed by fever; and, at the same time, there was a recurrence of pain and swelling in the neighborhood of the right knee, with some degree of pain and tenderness extending up the thigh, and down the leg. The swelling had the same character as formerly.

August 20. She continued in nearly the same state, with painful startings of the limb, and perspirations at night. Pulse very frequent. She was directed to resume the use of calomel and opium.

Sept. 2. There was no material improvement as to the local symptoms: a blister was applied to the knee.

She continued in nearly the same state, sometimes a little better, sometimes a little worse, with a very frequent pulse, and the general health, on the whole, declining, until the 7th of October; when an issue was made with caustic in the neighborhood of the knee. The issue seemed to occasion some abatement of the local symptoms. Her bodily powers, however, continued to decline, and she became affected with an ulcer over the sacrum, the result of long-continued pressure.

Oct. 14. She complained of severe pain in the left shoulder.

Oct. 15. She was seized with a vomiting and purging, accompanied with pain and tenderness of the abdomen and cold extremities. Pulse 140. At midnight she had a severe rigor.

The vomiting and purging continued, in spite of the remedies which were employed. In the afternoon of October 16, she had another rigor, and in about two hours afterwards she expired.

On examining the body, the knee-joint was found to contain neither pus nor synovia. The cartilage of all the bones which enter into the composition of the joint were ulcerated in several places, especially that of the inner condyle of the femur. A slight extravasation of blood had taken place into the cavity of the joint apparently from the surfaces of the bone exposed in consequence of the ulceration of the cartilages. The periosteum could be easily peeled off the surface of the femur, and the bone underneath appeared to be more vascular than is natural. The stomach was distended with an acid fluid of a green color, similar to what had been vomited on the day preceding death. The gall bladder was full of a very pale yellow fluid. There were no other morbid appearances.

The left shoulder, to which pain had been referred for a short time previous to death, was carefully examined, but no disease was detected in it.

It would be needless to add to the foregoing list an account of other cases, in which the disease was in a still more advanced stage. The progress of it in other joints, corresponds with that in the hip; and whatever may be the joint affected, there is ultimately the same complete destruction of the cartilages, and the same extensive ravages are committed among the bones and soft parts.



## SECTION II.

*On the Symptoms of this Disease.*

The ulceration of the articular cartilages may occur at any period of life ; but it is most frequent in those who have passed the age of puberty, and who are under thirty or thirty-five years of age. We meet with it, however, sometimes in young children, and at other times in old persons. In general, the disease is confined to a single joint ; but occasionally two or three joints are affected in the same individual, either at the same time or in succession. Sometimes the patient traces the beginning of his symptoms to a local injury ; but for the most part no cause can be assigned for the complaint, and often the cause to which it is attributed appears to be imaginary rather than real.

It is this disease which forms the great majority of those cases of caries of the hip-joint which occur in adult persons ; whereas, in children, the hip-joint is principally affected by that scrophulous disease affecting the cancellous structure of the bones, which will be described hereafter. These two classes of cases have many circumstances in common ; and as I shall, in the present chapter enter into a minute history of the progress of the former, I shall be enabled, in the next chapter, to confine my observations respecting the latter chiefly to those points of difference on which our diagnosis, so far as it can be made, must mainly depend.

Where the cartilages of the hip are ulcerated, as a consequence of inflammation of the synovial membrane, the peculiar symptoms which it presents are preceded by those of the last mentioned disease : otherwise, the only symptoms met with, for some time, are pain, and a slight degree of lameness in the lower limb. The pain at first is trifling, and only occasional ; afterwards becoming severe and constant. It resembles a good deal the pain of rheumatism, since it often has no certain seat ; but is referred to different parts of the limb in different individuals, and even in the same individual at different periods. As the disease advances, the pain becomes exceedingly severe, particularly at night, when the patient is continually roused from his sleep by painful startings of the limb. Sometimes he experiences some degree of relief from the pain in a particular position of the joint, and in no other. A patient in St. George's Hospital never obtained any rest, except when he had placed himself on the edge of the bedstead, with his feet on the ground, and resting his body on a pillow, in a position between that of lying and sitting. Another patient was seen night and day, crouching on his knees and elbows.

As the pain increases in intensity, it is more confined in its situation. In the greater number of instances, it is referred to the hip and the knee also ; and the pain in the knee is generally the most severe of the two. At other times there is pain in the knee, and none in the hip. Sometimes there is pain referred to the inside of the thigh ; or even to the foot. Wherever the pain is situated, it is aggravated by the motion of the joint ; but it is aggravated in a still greater degree by whatever occasions pressure of the ulcerated cartilaginous surfaces against each other. Hence the patient is unable to support the weight of the body on the affected limb ; and if he be placed on an even surface in a horizontal position, and the hand of the surgeon be applied to the heel, so as to press the head of the femur against the concavity of the aceta-

bulum, violent pain is the consequence; although this be done in so careful a manner that not the smallest degree of motion is given to the hip-joint. This circumstance is well deserving of attention; and no one should attempt to give an opinion as to the nature of a disease connected with the hip, without having made an examination in the manner which has been just described.

Soon after the commencement of the complaint, the hip-joint is found to be tender, whenever pressure is made on it, either before or behind. The absorbent glands in the groin become enlarged, and sometimes suppurate. Occasionally there is a slight degree of general tumefaction in the groin. In this there is nothing remarkable, since we must suppose, that a disease going on within the articulation must ultimately occasion some degree of inflammation in the neighboring parts. But it is a curious circumstance, that in some cases there is tenderness of those parts to which, though not diseased themselves, the pain is referred from sympathy with the disease in the hip. I have observed this in the knee several times; and I have also seen a slight degree of puffy swelling of this joint, where pain was referred to it, in consequence of disease in the hip. These facts correspond to what may be observed in some other cases, where pain is referred to a sound part, in consequence of a sympathy existing between it and some other part that labors under disease: for example, I have known the passage of a calculus down the ureter to occasion not only pain, but tenderness, swelling, and no trifling inflammation of the testicle.

When the disease has existed for some time, the nates undergo a remarkable alteration in their form. They become wasted and less prominent; so that instead of their usual convexity, they present the appearance of a flattened surface; they are flaccid to the touch, and hang more loosely towards the lower edge; and they have the appearance of being wider than those of the other side. In a very few cases, in the advanced stage of the disease, the nates are really wider, in consequence of the acetabulum being filled with coagulated lymph and matter, and the head of the femur being pushed out of its natural situation. But, in general, the increased breadth of the nates is only apparent, and, on an accurate measurement, no difference will be found between the nates of one side and those of the other. The alteration in the figure of the parts, in these cases, may arise partly from the position in which the patient usually places himself when he stands erect; but the principal cause to which it is to be attributed, is the wasting of the large fleshy bellies of the glutæi muscles from want of use; and this has been ascertained, by repeated and accurate examinations of the living, and numerous dissections of the dead body.\*

Another symptom which occurs in this disease, is an alteration in the length of the limb. 1st, In the early stage of the disease the patient often complains, that the limb on the affected side is longer than the other. This cannot be explained on the supposition of the acetabulum being filled with pus, or solid substance, since this would cause the head of the femur to be pushed outwards rather than downwards. The fact is, that there is only an apparent, and no real, elongation of the limb. If the patient be placed on his back in the hori-

\* This alteration in the form of the nates is a symptom, but is not in itself to be considered as a certain diagnostic mark of disease in the hip-joint; as it may be observed in other cases, where, from any cause, the glutæi muscles have been for a considerable time in a state of inaction. Thus children are subject to a paralytic state of the muscles of the lower limb; and in this complaint, if the muscles are affected as high as the pelvis, the nates present to the eye the same appearance. It may be noticed also where there is disease of the thigh-bone, or where from any other cause, the motion of the hip is painful and difficult.



zontal position, with the thighs parallel to each other, the foot on the diseased side may at first appear as much as two or three inches lower than the opposite foot; but, if the distance be accurately measured with a tape; from the anterior superior spinous process of the ilium to the patella, no difference is perceptible. The apparent elongation is produced by the position of the pelvis being altered, in such a way that the crista of one ilium is visibly depressed below the level of that of the other. It is easy to understand how this effect is produced, by observing the position in which the patient places himself when he stands erect. He supports the weight of his body on the sound limb; the hip and knee of which are, in consequence, maintained in the state of extension. At the same time the opposite limb is inclined forward, and the foot on the side of the disease is placed on the ground, considerably anterior to the other; not for the purpose of supporting the superincumbent weight, but for that of keeping the person steady, and preserving the equilibrium. Of course, this cannot be done without the pelvis on the same side being depressed. The inclination of the pelvis is necessarily attended with a lateral curvature of the spine; and hence it happens that one shoulder is higher than the other, and that the whole figure is in some degree distorted. All these symptoms will disappear in the course of a few weeks, if the patient, under these circumstances, be confined to his bed in the supine and horizontal position; except in some instances, where, in consequence of their having occurred in a young and growing person, and having already been allowed to exist for a considerable time, the shape of the parts has become adapted to their new situation, and the alteration of the figure may continue during life.

2. In a few cases, where the patient is in the erect position, it may be observed that the foot which belongs to the affected limb is not inclined more forward than the other, but that the toes only are in contact with the ground, and the heel raised; at the same time that the hip and knee are a little bent. This answers to the patient the same purpose of enabling him to throw the weight of his body on the other foot; but it produces an inclination of the pelvis in the opposite direction. The crista of the ilium is higher than natural, and there is an apparent shortening, instead of elongation, of the limb on the side of the disease.

3. In the very advanced stage of the disease, when the head of the femur has been completely destroyed by ulceration, there is nothing to prevent the muscles from pulling the bone upwards. This may be compared to a case of fractured neck of the femur. The limb is not only apparently, but it is really, shortened; the foot may be rotated inwards, but, if left to itself, it generally is turned outwards.

4. In other cases, the limb is shortened; the thigh is bent forwards; the toes are turned inwards, and do not admit of being turned outwards; and there is every symptom of a dislocation of the hip upwards and outwards. The following case fully explains the cause of these appearances.

**CASE XL.**—Taylor, a middle-aged man, was admitted into St. George's Hospital in the autumn of 1805, on account of a disease in his left hip. He labored also under other complaints; and he died in the February following.

On inspecting the body, the soft parts in the neighborhood of the joint were found slightly inflamed, and coagulated lymph had been effused into the cellular membrane round the capsular ligament.

There were no remains of the round ligament.

The cartilages had been destroyed by ulceration, except in a few spots.

The bones, on their exposed surfaces, were carious; but they retained their natural form and size. The acetabulum was almost completely filled with



pus and coagulated lymph; the latter adhering to the carious bone, and having become highly vascular. The head of the femur was lodged on the dorsum of the ilium. The capsular ligament and synovial membrane were much dilated; and, at the superior part, their attachment to the bone was thrust upwards, so that, although the head of the femur was no longer in the acetabulum, it was still within the cavity of the joint.

Since the man did not attribute this disease to any local injury, we may conclude that the ulceration of the cartilage was the primary affection, and that the dislocation had been produced in consequence of the destruction of the round ligament, and of the head of the femur having been first pushed outwards by the coagulated lymph and pus which occupied the cavity of the joint, and then drawn upwards by the action of the muscles inserted into the great trochanter.\*

The shortening of the limb,† which takes place in the advanced stage of the disease, is usually, but not always, the precursor of abscess. The formation of matter is also indicated by an aggravation of the pain, by more frequent spasms of the muscles, by a greater wasting of the whole limb, and by the circumstance of the thigh becoming bent forward, and being incapable of extension without such an increase of the patient's sufferings as he will be unable to endure. At the same time the pulse becomes frequent, the tongue furred, and the whole system is in a state of preternatural excitement. The abscess usually shows itself in the form of a large tumor over the vastus externus muscle; sometimes on the inside of the thigh, near the middle; and occasionally two or three abscesses appear in different parts and burst in succession. The abscesses discharge a large quantity of thin pus; and, in the worse cases, a copious suppuration continues, until the powers of the patient are exhausted, so that, enfeebled and emaciated, he sinks under the symptoms of a hectic fever. That an adult should recover under these circumstances, is so rare an occurrence, that the surgeon can never be justified in giving any but the most unfavorable prognosis. Children recover more frequently in this advanced stage of the disease; but seldom without a complete ankylosis of the joint. If suppuration has not taken place, it generally, but not always, happens, that the limb, after the cure, regains its natural degree of mobility.‡

When the cartilages of the knee are ulcerated, there is pain in the affected joint; at first, it is slight and only occasional, and, in the early stage of the disease, it is completely relieved by remaining in a state of rest for a few days; but it returns as soon as the patient resumes the exercise of the limb. By degrees the pain becomes constant and very severe, particularly at night, when it disturbs the patient by continually rousing him from his sleep. The pain is referred principally to the inside of the head of the tibia; but some-

\* This case affords one example of the dislocation of the hip from an internal cause, which some surgical writers have described. Other examples of this kind of dislocation occur in cases of inflammation of the synovial membrane, as has been explained in a former chapter.

† The morbid affections of the hip most liable to be confounded with that which has been above described, are the following:—

1. Inflammation of the synovial membrane.
2. The scrophulous disease, having its origin in the bones of which I shall speak hereafter.
3. A painful nervous affection, which occurs chiefly in young females disposed to hysteria; which will also be noticed in a subsequent chapter.
4. Affections of the sciatic nerve, of the upper part of the femur, and other diseases external to the hip are not unfrequently mistaken for disease in the joint itself, especially by surgeons of limited experience, who are misled by the wasting of the glutæi muscles, and the flattened appearance of the nates, which may occur in any one of these cases.

times a slighter degree of pain extends down the whole of that bone. The pain is aggravated by motion, so that the patient keeps the limb constantly in one position, and generally half bent; and he never attempts to support the weight of the body on the foot of this side.

The ulceration of the cartilages of the knee differs, with respect to its symptoms, from inflammation of the synovial membrane, in this,—that the pain in the former is slight in the beginning, and gradually becomes very intense, which is the very reverse of what happens in the latter. But there is another circumstance, which forms a remarkable distinction between the ulceration of the cartilages, and most other diseases to which this joint is liable. The pain, in the first instance, is unattended by any evident swelling; which comes on never in less than four or five weeks, and often not until several months have elapsed from the commencement of the disease. The reason of this is too manifest to require explanation, and it is equally unnecessary to point out the importance of it, as affording the means of making a more ready diagnosis. We must, not, indeed, conclude indiscriminately, whenever there is a slight pain in the knee, unattended by swelling, that the cartilages are in a state of ulceration, since this symptom may equally arise from inflammation of the bones themselves; of the ligaments; of the fatty substance of the joint; or from simple nervous affection; and instances will occur to every surgeon, where there is reason to believe that the above-mentioned symptom arises from one or other of these causes. But when the pain continues to increase, and at last becomes very severe; when it is aggravated by the motion of the joint, and by the pressure of the articulating surfaces against each other; and when, after a time, a slight tumefaction takes place, such as I shall presently describe; we may conclude that the disease consists in an ulceration of the cartilages; and, in all such cases which have come under my own observation, their subsequent progress, and the morbid appearances presented by dissection, where an opportunity has occurred of observing them, have fully justified this conclusion.

The swelling which attends this disease, in the knee, differs from that which occurs in either of those diseases of the synovial membrane which I have formerly described. It arises from a slight degree of inflammation having taken place in the cellular membrane external to the joint, in consequence of the disease within it. The swelling is usually trifling, appearing greater than it really is, in consequence of the wasting of the muscles of the limb. It has the form of the articulating ends of the bones; that is, the natural form of the joint. No fluctuation is perceptible, as where the synovial membrane is inflamed; nor is there the peculiar elasticity which exists where the synovial membrane has undergone a morbid alteration of structure.

But a few cases occur in which this disease is attended with a collection of fluid in the joint, and in which, therefore, the tumor has a form different from that which has been described, and giving to the hand a distinct sense of fluctuation.

1st. Inflammation of the synovial membrane may terminate in ulceration of the cartilages; in which case it sometimes happens, that the flum, secreted into the cavity of the joint, in consequence of the primary disease, is absorbed; while, in other cases, it is *not* absorbed before the peculiar symptoms of the secondary disease have shown themselves; or,

2dly. This order may be reversed; inflammation of the synovial membrane being the secondary disease, ulceration of the cartilages having preceded it, and the effusion of synovia into the joint being the consequence of it. This I supposed to have happened in the case of John Child; which will be related hereafter.



3dly. In an advanced stage of ulceration of the cartilages, where an abscess is formed, it occasions ulceration of the soft parts, and usually makes its way to the skin : but sometimes the pus is collected in the joint, distending the synovial membrane, and causing a tumor very similar to that which would arise from it being distended with synovia. In these cases, the surgeon must form his diagnosis, by attending to the previous history ; by observing the degree and the kind of pain of which the patient complains ; and the state of his general health ; and by bearing in mind this circumstance, that blisters very seldom fail in procuring absorption of the too abundant synovia, and that they never cause the absorption of pus.

As the ulceration of the cartilages is sometimes followed by dislocation of the hip ; so we find that dislocation of the knee occasionally takes place from the same cause. Where there has been considerable destruction of the soft parts, in consequence of ulceration extending to them, the head of the tibia is gradually drawn backwards by the action of the flexor muscles, and lodged in the ham ; and I have even known this to happen where abscess has never formed, the patient ultimately recovering with a stiff joint and disfigured limb. In such a case, the condyles of the femur make an unusual projection, and the articulating surfaces of the bones are partially, or entirely, separated from each other.

The symptoms produced by the ulceration of the cartilages of other joints correspond very nearly with those already described. The principle diagnostic mark is the pain, which is experienced in the beginning unattended by swelling, and which is invariably increased by the pressure of the articulating surfaces against each other. The pain is referred to the part which is the actual seat of the disease : but, where the elbow is affected, the more violent pain in this joint is accompanied by a slighter degree of pain in the lower part of the fore-arm and wrist ; and where the disease is in the shoulder, there is often a painful sensation, extending down the whole of the bone of the arm. In cases of ulceration of the cartilages of the shoulder, the joint is smaller than natural, in consequence of the wasting of the deltoid muscle. When an abscess forms in connection with this joint, it often assumes a somewhat singular appearance, when it was first penetrated through the deltoid muscle ; so that I have known it more than once to be mistaken for an encysted tumor. In the advanced stage of the disease in the shoulder, the joint is liable to be dislocated in the direction forwards. Sometimes the dislocation is only occasional, the head of the bone slipping forwards, so as to make a visible projection, in certain motions of the arm, and again returning to its place ; at other times, the dislocation is permanent, the head of the bone resting on the anterior margin of the glenoid cavity of the scapula, and gradually making a new cavity for itself in this situation.

Whatever joint is the seat of the disease, the formation of abscess is always attended with an aggravation of all the symptoms. But the degree in which the general system is disturbed, when suppuration is established, depends on various circumstances ; on the age and powers of the patient ; on the size of the affected joint ; and on its situation. An abscess connected with a deep-seated joint occasions more extensive mischief of the soft parts, before it reaches the surface, and, therefore, is productive of more serious consequences, than one which is connected with a joint which is situated superficially.

The progress of the ulceration of the cartilages varies, with respect to time, in different cases, but it is generally tedious. In one case where violent pain had existed in the knee, with little or no swelling, for two years and a half



previous to amputation, I had an opportunity of examining the diseased joint, and found the cartilages destroyed for only a small extent; a dram and a half of pus in the articular cavity, and no morbid appearances of the soft parts, with the exception of a very slight inflammation, which had been induced in the synovial membrane, and the effusion of a minute quantity of coagulated lymph into the cellular texture on its external surface. In another case, the pains in the lower limb had existed for a whole year, before they were sufficient to attract the patient's serious attention. In this case no pus was formed in the joint; and the ultimate recovery was complete, without the smallest detriment to the motion of the limb. Sometimes, however, the progress of the disease is much more rapid. There was a patient in St. George's Hospital, in whom, in the course of four months, the destruction of the head of the femur and acetabulum was such as to occasion a real shortening of the limb to the extent of an inch.

### SECTION III.

#### *On the Treatment.*

It is, of course, of importance that attention should be paid to the general health, and that such internal remedies should be exhibited as are indicated by the peculiar circumstance of each individual case. Where there is any febrile excitement of the system, saline and antimonial medicines, and occasional purgatives, are proper. Where the patient, in the advanced stage of the disease, finds his bodily powers enfeebled, and is troubled with nocturnal perspirations, bark, or some other vegetable tonic, combined with mineral acids, may be given with advantage; and opium, or extract of poppies, may be administered to those whose rest is disturbed by attacks of excruciating pain. Where the disease in the joint is attended with a disordered condition of the functions of the digestive organs, it is undoubtedly proper to endeavor by suitable remedies to restore these to a more healthy state. I cannot doubt that a course of sarsaparilla, properly prepared, and administered in full doses, is often productive of the greatest benefit; and it seems to be a medicine especially adapted to those cases in which the ulceration of the cartilages is connected with a chronic inflammation of the bone in the neighborhood. Where inflammation of the synovial membrane is associated with the other disease, either as cause or effect: it requires the same kind of treatment as is necessary for its cure on other occasions. A case will be related hereafter, in which ulceration of the cartilages of the knee seemed to have originated in a rheumatic inflammation of the bone and periosteum, and in which the patient derived the greatest advantage from the internal use of mercury. Beyond what has now been mentioned, I am not aware that it is possible to lay down any general rule as to medical treatment. Undoubtedly, there is no medicine of which it can be said that it exercises a specific influence over the disease; nor does it, indeed, appear reasonable to expect that such a specific should exist, when we consider under what a variety of circumstances the disease may take place.

When the cartilages of a joint are ulcerated, it may well be supposed that the motion of their surfaces on each other must be favorable to the progress of ulceration. I have known some cases, in which rest alone was sufficient to produce a cure. In all cases the symptoms of the disease are aggravated

by any considerable exercise; and we may, therefore, conclude that the keeping the limb in a state of the most perfect quietude, is a very important, if not the most important, circumstance to be attended to in the treatment. When the affected joint is in the lower limb, the patient should be confined to the bed, or, at any rate, to the sofa. In most instances, a splint or some other contrivance, may be employed in such a manner as to maintain the diseased joint in a state of absolute immobility; and this should be always regarded as one of the principal points to be attended to in the surgical treatment. The apparatus made use of for this purpose should be such as is efficient, and, at the same time, simple, light, and commodious to the patient. The plasters and bandages recommended by Mr. Scott, in the work to which I have formerly referred, operate, as I conceive, on the principle which has been here laid down, and are often productive of benefit.

Issues made with caustic\* have been recommended by many practitioners for the cure of diseased joints; but, as far as I know, no one has attempted to point out the particular class of cases, to which this remedy is particularly applicable. I have employed caustic issues, and seen them employed, in a great number and variety of instances, and have found them to be usually productive of singular benefit, where the cartilages are in a state of ulceration, and to be of much more service in these than in the other morbid affections to which the joints are liable. Setons and blisters, kept open by means of the savine cerate, appear to operate nearly in the same manner as caustic issues, and may be used with advantage in the same description of cases.†

Local blood-letting, or bleeding, or bleeding from the arm, is occasionally productive of advantage in the beginning, especially in some cases, which occur chiefly in hospital practice, in which the patient, from too freely exercising the limb, has brought on an inflammation of the ulcerated surfaces, occasioning an aggravation of the pain, and usually some degree of fever.

In the early stage, the warm bath is sometimes of service. At least it is capable of relieving the symptoms, if not of stopping the progress of the disease.

Plasters made of gum ammoniac, and others of a similar nature; embrocations and liniments of all kinds, are entirely inefficacious. Friction is invariably injurious.

\* The immediate relief, which sometimes follows the application of caustic to the skin, or the surface of an issue, when the limb is under precisely the same circumstances as before with respect to rest, and the return of the symptoms which in many instances, follows the early healing of an issue, sufficiently prove the efficacy of this remedy. It may be difficult to explain the *modus operandi*; but what happens in these cases seems to bear no distant analogy to the suspension of gonorrhœa by the occurrence of inflammation of the testicle, or the metastasis of gout from the stomach to the foot. Issues are employed in surgery for the purpose of stopping the morbid actions of the animal body; but it is probable that, if made of too great an extent, they would interfere with its natural actions also. In a guinea pig, a large abscess took place of one leg and thigh, in consequence of a local injury. The formation of the abscess completely stopped the growth of the claws on the foot of this side. They wore away at the points, without being regenerated at the base; became short and dry, and readily cracked and splintered; while, on the foot of the opposite limb they continued to grow as usual, and possessed their ordinary appearance.

† It may be expected that I should, in this place, offer some remarks on the effects of the application of the actual cautery in the form of the hot iron, or the moxa, which has been recommended, at different times, for the relief of some cases of diseased joints. I do not, however, feel myself warranted in giving any confident opinion as to the comparative efficacy of issues made by the caustic, and those made by the cautery; my experience of the latter being much more limited than that of the former. What I have seen, however, does not lead me to believe that the cautery is in any respect more efficient than the caustic: and there are, certainly, some considerable objections to its use, to which the caustic is not liable.



I have shown in a former section that ulceration of the articular cartilages may take place to a considerable extent, without suppuration being established. This is a circumstance of much interest in pathology, and in a practical point of view of great importance. The prospect of a cure which the employment of any remedies affords is undoubtedly much greater where abscess does not exist, than where it does; and the prognosis, which the surgeon gives, must depend in a great degree on the opinion which he is led to form on this subject.

Having premised these general observations, I shall proceed to offer a few practical remarks; first, on the treatment of this disease in the hip, and afterwards in other joints, without reference to suppuration having taken place; secondly, on the plan which should be adopted where suppuration is established, and there is a collection of pus communicating with the articular cavity.

When the cartilages of the hip are ulcerated, the patient should be confined to his bed or couch, being never allowed to move from it on any occasion. If left to himself, he is generally inclined to lie on the side opposite to that of the disease. There are, however, good reasons why this position should be avoided, if possible. It necessarily distorts the pelvis, and increases the disposition to a lateral curvature of the spine. It also, in those cases in which the round ligament of the joints is destroyed, facilitates the escape of the head of the femur from the acetabulum, and the production of dislocation. Something may be done towards preventing this last effect, by interposing a pillow, or thick cushion, between the knees; and it is difficult to do more than this, after the patient has already been lying on his side for a considerable time; or otherwise he should be placed on one of the bedsteads invented by Mr. Earle, lying on his back, with the shoulders and thighs somewhat elevated, and the latter as nearly as possible parallel to each other. This supersedes the necessity of having recourse to splints and bandages, and, with a view to the confinement of the hip-joint, is all that is required in the early stage of the disease.\* At a later period when, in consequence of the extensive destruction of the articulation, the muscles begin to cause a shortening or retraction of the limb, I have found great advantage to arise from the constant application of a moderate extending force, operating in such a manner as to counteract the action of the muscles. For this purpose an upright piece of wood may be fixed to the foot of the bedstead, opposite the diseased limb, having a pulley at the upper part. A bandage may be placed round the thigh above the condyle, with a cord attached to it, passing over the pulley, and supporting a small weight at its other extremity. I will not say that the effect of such a continuance is to prevent the shortening of the limb altogether; but I am satisfied that it will, in a number of instances, render it less than it would have been otherwise, at the same time preventing or very much diminishing that excessive aggravation of the patient's sufferings with which the shortening of the limb is usually accompanied.

The use of the bedstead which I have mentioned is quite compatible with the employment of any method of counter-irritation which may seem to be best adapted to the peculiar circumstances of each individual case.

In children, blisters are capable of affording complete relief. They may be applied, of a small size, on the nates, round the great trochanter, and in the groin. A blister, kept open by means of the savine cerate, is usually more

\* On some occasions, however, it is convenient to fix the pelvis by a strap or bandage, passing over it, from one side of the bedstead to the other; and even the thigh may be fixed in the same manner.



efficacious in this disease than a number of blisters applied and healed in succession.

In adults, the same treatment is useful in the very early stage of the disease; but, in the more advanced stage, issues made with caustic appear to be much more efficacious, and to be attended, on the whole, with less inconvenience to the patient.

The hollow behind the great trochanter of the femur, is, in many respects, the most convenient situation for the application of the caustic; but, in some cases, the application of it on the outside of the hip is attended with better effects. The skin of this part is, in fact, nearer to the joint than the skin behind; and there are some grounds for the opinion, that issues are more efficacious when made near to the seat of the disease than when made at a distance from it.\* The skin in the groin is still nearer to the hip than that on the outside, but the large vessels and nerves of the thigh forbid the use of the caustic at this part. A slough may be made with the caustic potash in the adult, half an inch in breadth, and two inches in length, behind the great trochanter. If this fails in giving relief, a second slough of a smaller size may be made on the anterior edge of the tensor vaginæ femoris muscle; and, in some instances, though no relief is afforded by the first issue, there is great relief from the second.

The good derived from the issue does not seem to be in proportion to the quantity of pus discharged from its surface. It has been observed by others, that sometimes more abatement of the symptoms is produced in the first few days after the caustic is applied, and before the slough has separated, than in several weeks afterwards. This circumstance first led me, instead of employing beans for this purpose, to keep the issue open simply by rubbing the surface occasionally with the caustic potash, or with the sulphate of copper; and, after an extensive trial of both methods, the latter has appeared to be decidedly preferable to the former. The pain produced by the caustic is very considerable, but the relief of the symptoms is such, that I have known patients to be in the habit of making the application themselves, saying that "they knew they should be better by the next morning." Besides, the issue managed in this way is more easily dressed than where beans are used; and the inconvenience arising from the beans slipping out under the adhesive plaster, and from any accidental pressure of them against the sore surface is avoided.

The cases in which complete relief of the symptoms immediately follows the making the issue, are not very numerous. In general, there is some degree of abatement on the caustic being applied; and, in a few weeks afterwards (provided that suppuration has not taken place), if the patient continues in a state of quietude, the pain entirely leaves him. Where the pain is exceedingly severe (as it sometimes is, so as to prevent sleep during many successive nights), it is very desirable that some method should be adopted, capable of affording more speedy relief than that which can usually be obtained from the application of the caustic. If there is reason to believe that the ul-

\* "I have for many years applied caustics above and below the internal condyle of the thigh-bone, for white-swollings of the knee, with various success; and I have remarked that, where this plan disappointed my hopes, and where a suppuration took place in the joint, the inflammation in almost every case arose, and that the matter collected generally made its way outwards, on the external side of the knee. Observing this fact repeatedly, I was led to believe that the caustic, in the manner I used it, checked the progress of the disease as far it had influence; but that the influence was not sufficient to pervade the whole cavity of the joint." Ford on the Hip-joint, p. 194, first edition.

cerated surfaces are in a state of inflammation, in consequence of the joint having been too much exercised, bleeding may be had recourse to. A blister may be applied to the groin, and repeated if necessary. Blisters applied to the knee, or to the thigh, though there is no actual disease in these parts, will often occasion considerable, or even entire, relief of the pain, which is referred to these parts in consequence of their sympathy with the hip. This is a curious circumstance; but I have known it happen in so many instances, that, however difficult it may be to explain it, I can entertain no doubt of the fact. Sometimes the pain is altogether relieved by the application of the blister; at other times, I have known it leave the knee to which the blister was applied, and attack the hip.

The objections which may be urged against the application of caustic to the skin of the groin, do not hold good with respect to a seton in this situation. I was led to adopt this treatment some years ago, partly from observing that the skin of the groin is nearer to the hip-joint than the skin elsewhere; partly from an expectation (though not a very confident one), that the making a seton over the trunk of the anterior crural nerve, might be particularly calculated to relieve the pain referred to those parts, to which the branches of that nerve are distributed. The results of this practice more than realised whatever hopes I had entertained of its success. In many cases the seton occasioned very speedily a complete relief of the pain. In other cases, indeed, it failed in producing the like good effects; but these cases have borne only a small proportion to those in which it has succeeded. On the whole, I am led to conclude, that where the pain is very severe, the seton in the groin is more calculated to afford immediate relief than the caustic issue; but that it is not so efficacious in checking the progress of the disease, as it is in lessening the violence of its symptoms; and that the caustic issue can be better depended on for the production of a cure.\*

\* The following are extracted from notes, which were taken formerly, when I was making observations on this subject. I will not undertake to say, that in every one of these cases, the disease was precisely that which is now under our consideration. Probably, in some of them, it was that scrofulous affection which will be described hereafter; but they equally serve to illustrate the effects of the seton in the groin, when the patient is exhausted by pain in consequence of disease in the hip.

"November, 1808.

"Martha Atkinson, fifteen years of age, labored under symptoms of ulceration of the cartilages of the hip. She had pain in the hip and knee, but that in the hip was the most severe of the two. Her sufferings were such, that she could not venture to make the slightest alteration in her position; and she could scarcely procure any rest at night.

"November 20, a seton was made in the groin.

"November 22, the pain in the hip was almost completely relieved; and from this time she mended rapidly."

"John Selly, eleven years of age, was admitted into St. George's Hospital on the 28th of December, 1808, with severe pain in the hip and knee: tenderness in the region of the hip, and enlargement of the glands in the groin.

"December 30, a seton was made in the groin.

"The pains in the hip and knee were almost completely relieved within a few hours after the seton was introduced. The relief was permanent, and on the 24th of May following, he left the hospital as cured."

"Susan Dean, about twelve years of age, was admitted into St. George's Hospital, in November 1808, with very severe pains in the hip and knee, in consequence of disease in the former joint. A large abscess presented itself on the upper and outer part of the thigh.

"On the 4th of December, a seton was made in the groin. The pains were relieved on the same afternoon. She had no return of pain while she continued in the hospital, but as her friends took her away in a few weeks after the seton was made, I had no opportunity of observing the termination of the case."

"James Craven, a young man, was admitted an out-patient of St. George's Hospital, on the 15th of March, 1809, with the usual symptoms of ulceration of the cartilages of the hip.



To make the seton in the groin, it is convenient to use a curved seton-needle. In the majority of cases, the patient keeps the thigh considerably bent on the pelvis; and this position of the limb makes it difficult to employ a needle of the usual form. The seton may be introduced obliquely on the anterior part of the joint, including from one inch and a half to two inches of integuments. After some time the skin over it usually inflames and ulcerates, and the seton drops out; but this does not happen before it has produced all the benefit which may be expected from it.

Of the above observations on the ulceration of the cartilages of the hip many are applicable to the disease in other joints.

In all cases it is indispensable that the parts affected should be kept in a state of the most complete repose, and this is to be accomplished by various means, accordingly as one or another joint is the seat of the disease. In some instances when the disease is in the knee, or ankle, or tarsal joints, nothing can be done better in the first instance, than simply to lay the joint on an air pillow, which, if not much distended with air, gives an uniform, regular, and most convenient support on every side; but, for the most part, it is better to have recourse to splints made of pasteboard, or stiff leather, neatly moulded to the figure of the limb. When the disease is in the shoulder, the forearm should be supported by a light leathern coat, suspended from the waist or neck, and the arm should be kept constantly bound to the side; and when it is in the ankle, great advantage will often arise from the patient wearing a common wooden leg, which will enable him to take exercise for the maintenance of his general health, without aggravating the local disease.

But whatever may be the mechanical means adopted for the purpose of preventing the motion of the diseased parts, care must be taken that they do not interfere with the use of those external, or (as they are called) counter-irritants, the great efficacy of which may be said to have been established by the experience and consent of surgeons of all ages and countries.

Where the knee or elbow is affected, we may employ the caustic issue, or the blister kept open by means of the savine cerate, but the former appears to be the most efficacious of the two. In the knee, a narrow slough may be made by rubbing the skin with the caustic potash on each side of the patella; and, in the elbow, the caustic may be applied in the same manner on the inside, and on the outside of the joint. When I have met with this disease in the shoulder, I have sometimes employed a large blister, and kept it open by means of the savine cerate; and in other cases I have made two caustic issues, one on the anterior, the other on the posterior part of the joint; and, on the whole, the caustic issues have appeared to be productive of better effects than the blister. Where the disease has its seat in those joints which are surrounded by numerous tendons, as the wrist and ankle, it may be more prudent to employ the blister, lest injury should be done to the superficial tendons by the application of the caustic. I have, however, in several cases made a caustic issue below the internal or external malleolus. It has produced the best effects with respect to the disease in the ankle, but has been

There was a large abscess on the outside of the thigh, and intense pain in the knee, preventing his rest at night.

"March 16, a seton was made in the groin. Being unable to become an in-patient of the hospital, he walked home afterwards. Nevertheless, the pain was completely relieved in a few hours; and he slept soundly at night, the pain not at all disturbing him.

"After this, the abscess burst, and collected again several times; and he became affected with hectic symptoms. I did not see the termination of the case, but I make no doubt of its having ended fatally.

sometimes attended otherwise with unusual irritation and distress to the patient, so that it was with difficulty that he could be induced to allow it to be kept open for a sufficient length of time.

I have seen many cases, in which the caustic issue has in the first instance removed all the symptoms of the disease; and yet, after some time, notwithstanding the patient has remained in a state of perfect quietude, and there has been no evident cause of aggravation, they have returned nearly in the same form as before, and with their original severity. In some of these cases, their recurrence is to be attributed to the issue itself; which, from some cause, that the present state of our knowledge does not enable us to explain, produces an effect apparently the opposite to that which is produced when it was first made. The issue being allowed to heal, the symptoms again subside, and perhaps the patient may find himself entirely and permanently relieved before the sore is completely cicatrised. The same thing may be observed, perhaps more frequently, where a blister has been long kept open by means of the savine cerate: and here, if the blister be of a large size, the recurrence of the pain is usually attended with a quick pulse, and a furred tongue, and much constitutional irritation; of all which the patient is relieved, when the blistered surface is allowed to skin over. It is evident that it is of much importance, and also that it may require considerable discrimination on the part of the surgeon, to distinguish when the issue or the blister begins to be injurious, and ought therefore to be persevered in no longer.

In other instances, where the symptoms have returned under the use of the caustic issue, it has appeared to me that this was to be explained in a different manner. A very small quantity of matter has been formed by the ulcerated surfaces of the joint, but not sufficient to prevent the application of the caustic from producing in the first instance very considerable benefit. But having once begun, the suppuration has continued, until a sufficient quantity of pus has been collected to occasion distension of the joint, and the reproduction of the former symptoms, in spite of the remedy which before relieved them. Such cases are not of very unfrequent occurrence, and they show that the surgeon should not incautiously give a very favorable prognosis in the first instance, because the immediate effects of the issue have been beneficial: but that he should wait and observe whether these good effects continue, before he ventures positively to predict his patient's recovery.

The treatment of the abscess, which arises from this disease in a joint, makes a question of very serious importance, but more so as it regards children, than adults; since the former may, and do frequently, recover even after an extensive suppuration has taken place; whereas, the recovery of an adult person from an abscess connected with ulceration of any of the textures belonging to a joint is a comparatively rare occurrence.

I have not found that the method of evacuating the matter, which has been recommended by Mr. Abernethy, in his *Treatise on the Lumbar Abscess*, is attended with any particular advantage in a case of carious joint. Indeed this corresponds with what a little consideration might lead us to expect. If an abscess takes place as a primary affection, the disease being confined to the soft parts, there may be nothing to prevent the contraction of the cyst, and gradual diminution of the quantity of pus evacuated at each puncture. But where an abscess occurs, in consequence of an ulcerated state of the articular cartilages and bones, as the cause of the abscess exists equally after, as before the puncture, the suppuration will necessarily be kept up, and the contraction of the cyst, and the obliteration of its cavity, will be prevented.

In some instances I have been led to believe, that, after the application of



the caustic, the tumor formed by the abscess has diminished in size; as if from an absorption of a portion of its contents. I have, however, seen no instance of complete absorption having taken place under this treatment, nor have I been more successful in my attempts to procure the absorption of an abscess by other means. Emetics, whether they were given to excite vomiting, or only in nauseating doses, were, in my experiments, of no service. Electricity was never useful; appearing rather to occasion a more rapid accumulation of matter. It being supposed that pressure, under certain circumstances, causes an increased action of the absorbent vessels, in two cases I applied strips of adhesive plaster round the limb, with the view of trying the effects of pressure on the contents of the abscess. The consequence was, a speedy diminution of the external tumor; but I afterwards found that this arose, not from any absorption having taken place, but simply from the increased resistance on the surface causing the abscess to occupy a larger space in the interior of the limb. Yet I do not feel myself justified in asserting, that there is no such thing as the spontaneous cure of an abscess by absorption. I have certainly seen several instances of tumors, having all the external characters of abscess, which, in the course of a few months, and sometimes in a much shorter space of time, have wholly disappeared. The question, however, will always remain, whether such a tumor was really an abscess, or simply a collection of serum. A young woman was admitted into St. George's Hospital, having a tumor containing fluid, tender to the touch, and with the skin over it inflamed, on the anterior part of the pectoral muscle, near the axilla. Not doubting that it was an abscess, I punctured it with a lancet, and a considerable quantity, not of pus, but of pure serum, escaped. Some time afterwards a similar tumor presented itself in the neighborhood of the former one, which I did not puncture, and this disappeared spontaneously, without discharging its contents. If I had not punctured the first tumor, I might probably have regarded each of them as affording an example of an abscess having been removed by absorption.

The early puncture of an abscess connected with a diseased joint, is certainly not to be recommended. I have always observed, that such an abscess has healed more readily, and that the opening of it (whether by a natural process, or by the lancet) has been attended with fewer ill consequences, where the patient has been kept for some time in a state of perfect quietude, and the other methods of treatment, formerly mentioned, have been previously resorted to, than where it has taken place immediately on the patient coming under the care of the surgeon. Nor is this difficult to explain: in the latter case, at the bottom of the abscess there is a carious or ulcerated surface of bone; in the former, it is highly probable, that the process of cure has already begun, and that where there was diseased bone before, there is now a granulating surface. At any rate it cannot be supposed, that when, in consequence of the neglect of the disease, the ulcerated bones, as well as the other parts, are in a state of inflammation, the abscess can be under such favorable circumstances for being opened, as when such inflammation has been previously allowed to subside, under rest, and the employment of proper remedies.

An abscess connected with any joint, but particularly one connected with the hip, does not form a regular cavity, but usually makes numerous and circuitous sinuses in the interstices of the muscles, tendons, and fasciæ, before it presents itself under the integuments. It is therefore less easy to evacuate its contents, than those of an ordinary lumbar abscess; and indeed it can seldom be emptied, without handling and compressing the limb, in order to press the matter out of the sinuses, in which it lodges. But this is often at-

tended with very ill consequences. Inflammation takes place of the cyst of the abscess, and pus is again very rapidly accumulated. Small blood-vessels give way on its inner surface, the bloody discharge of which, mixed with the newly-secreted pus, goes into putrefaction, and exceedingly irritates the general system. I have seen cases, where, after a great deal of pains having been taken to obtain the complete evacuation of the contents of the abscess, and the puncture having healed, in a few days the tumor has become as large as ever, attended with pain in the limb, and a fever resembling typhus in its character, and threatening the life of the patient. A second puncture having been made, a quantity of putrid fetid pus, of a reddish brown color, has escaped; the confinement of which had produced all the bad symptoms, which have been immediately relieved by its evacuation.

The practice, which has appeared to me to be, on the whole, the best, is the following. An opening having been made with an abscess lancet, the limb may be wrapped up in a flannel wrung out of hot water, and this may be continued as long as the matter continues to flow of itself. In general, when a certain quantity has escaped, the discharge ceases; the orifice heals, and the puncture may then be repeated some time afterwards; but where the puncture has not become closed, I have seldom found any ill consequences to arise from its remaining open.

I have already observed that the prognosis, which the surgeon is led to form, must depend very much on the circumstance of suppuration having, or not having, taken place. The formation of even the smallest quantity of pus in the joint, in cases of this disease, very much diminishes even in the young person, and still more in the adult, the chance of ultimate recovery. On the other hand, where abscess has not begun to form, there is perhaps no disease, among those which come under the care of the surgeon, in which he can employ his art with a better prospect of success than this. It is to be observed, however, that the symptoms may be relieved, while there are still some remains of the disease: or, at any rate, while there is still a disposition to relapse; and in order that the cure should be permanent, it is necessary that the treatment should be employed for some time after the patient is apparently recovered. A gentleman who had long labored under ulceration of the cartilages of the hip, finding himself to be free from all uneasiness, allowed the issue to be healed. This was attended with no immediate ill consequences; but in the course of two or three months he began to experience the well-known symptoms of his former complaint. A caustic issue was again made, and he was again relieved. The issue was kept open for twelve months longer and then healed. When I last saw him, two or three years after the healing of the issue, he continued perfectly well. This, however, is only one of many cases, which might be quoted in proof of the above observation.

When the ulceration of the cartilages has made very considerable progress, if the patient recovers, so as to preserve the limb, he seldom has the use of the joint afterwards, the bones composing it being united by ankylosis; but if it has been checked in a less advanced stage, even though there may be reason to believe that the cartilages have been extensively destroyed, the patient may retain the natural motion of the joint. Cases will be found in other parts of this volume, in which the bony surfaces of a joint were covered by a dense membrane, formed to supply the place of the cartilage which had been destroyed; and I cannot assert that this membrane is never ultimately converted into the true cartilaginous structure. In other instances a compact layer of bone is generated on the carious surface, nearly similar to what is seen in the healthy bone, after the cartilage has been destroyed by maceration. I



have many times in dissection, observed a portion of the cartilage of a joint wanting, and in its place, a thin layer of hard, semi-transparent substance, of a grey color, and presenting an irregular granulated surface. It is probable that in these cases also the original disease had been ulceration of the cartilages. In a subject in the dissecting room, I found no remains of cartilage on the bones of one hip; but, in its place, a crust of bony matter, of compact texture, of a white color, smooth, and having an appearance not very unlike that of marble. Of course, in this instance I could learn nothing of the history of the disease: but I suspected that it had been originally ulceration of the articular cartilage, and this opinion seemed to derive confirmation from the following case, which occurred afterwards.

CASE XLI.—A woman, thirty-six years of age, was admitted into St. George's Hospital, with pain in the hip and knee on one side. The nates were wasted and flattened, and a large abscess had burst, leaving a sinus communicating with the hip-joint. She was affected with hectic fever, and gradually sunk and died.

On inspecting the body, various sinuses were found in the neighborhood of the hip, and communicating with it.

The synovial membrane and capsular ligament had undergone no alteration in their appearance, beyond what evidently depended on the abscess. The cartilage was every where absorbed from the articulating surfaces, and in its place there was a white polished surface, similar to that which has been just described.

#### SECTION IV.

##### *Cases of this Disease.*

The following cases, which are taken from many similar, of which I have preserved notes, are intended to illustrate the observations contained in the two last sections. There seems to be no doubt that the disease was ulceration of the articular cartilages, since the symptoms exactly correspond with those which have been observed in cases of this description, in which an opportunity occurred of examining the morbid appearances after death, or after amputation. It will be observed, that I have not selected cases in which the disease was situated in the hip; nor those in which it had reached its most advanced stages; my reasons for which have been, that a sufficient number of examples of this affection of the hip, may be found among the cases already published by Mr. Ford, and other writers; and that it is in its early stage that the disease principally deserves to be studied, and that the diagnosis is of the most importance.

CASE XLII.—Mary Jenkins twenty-one years of age, in May, 1809, received a blow on one of her knees. Soon afterwards, she was seized with pain in the joint, which gradually became more severe. In September of the same year she was admitted into St. George's Hospital, on account of this, and of some other complaints, which required medical treatment. At first she was under the care of Dr. Bancroft. On the 9th of November, she came under the care of the surgeons. At this time, the knee was somewhat swollen; the swelling having the form of the articulating ends of the bones, and appearing greater than it really was, on account of the wasting of the muscles of the limb. No fluid was perceptible in the joint. She complained

of violent pain, which she referred chiefly to the inside of the head of the tibia, and which was extremely aggravated by motion. There was no redness of the skin. She was emaciated, and labored under a slight degree of hectic fever.

An issue was made with caustic on each side of the ligament of the patella. The issues were kept open by means of peas; their surfaces being also rubbed with caustic every fourth day.

At the expiration of a fortnight the pain was very much abated; she was able to give some motion to the joint without much uneasiness. The swelling had nearly disappeared.

In a short time the pain was completely relieved; however, she did not quit the hospital until the September of the following year. At this time she was free from all bad symptoms, and had recovered the perfect use of the joint.

**CASE XLIII.**—John Reade, twenty-eight years of age, applied for relief as an out-patient, of St. George's Hospital, on the 4th of October, 1811.

He said, that for two years preceding he had been subject to pains in the elbow, which were occasionally severe, but attended with little or no swelling. At the time of his coming to the hospital, the pain in the joint was very violent, particularly at night, when it continually roused him from his sleep. There was also pain in the shoulder and wrist; but trifling when compared to that in the elbow, and only occasional. The elbow was slightly swollen, the swelling having the form of the articulating ends of the bones, and arising, not from fluid within the joint, but from inflammation having extended to the cellular membrane external to it. The fore-arm was kept bent, and all attempts to move it from this position caused a severe aggravation of the symptoms. There was some degree of symptomatic fever.

Eight ounces of blood were taken from the other arm, which occasioned some, but not considerable relief.

October 8th. A caustic issue was made on each side of the joint.

October 11th. He was free from the symptomatic fever; the pain in the shoulder and wrist had entirely left him; that in the elbow was much diminished.

October 16th. The sloughs were separated. The issues were afterwards kept open by the occasional application of caustic. He now made very little complaint of pain, and slept well at night. From this time he experienced very little uneasiness. He gradually recovered the use of the elbow; and in a few weeks, finding no inconvenience from the complaint, he ceased to attend at the hospital.

**CASE XLIV.**—A lady, thirty-three years of age, in November, 1816, first experienced a pain in the articulation of the lower jaw, on the left side; and this was attended with a sense of stiffness, and difficulty of taking and masticating food. Some liniments were used, which seemed rather to aggravate the complaint, and were therefore left off. From this time the symptoms gradually and slowly increased; and, in May, 1818, when I was consulted, they were as follows:—There was severe pain in every motion of the lower jaw, especially in masticating the food and yawning. The pain was induced whenever pressure was made in the situation of the articulation of the lower jaw with the left temporal bone; but there was no tenderness in any other situation. From this joint, however, as from a centre, the pain extended in various directions; to the temple; to the back of the head, towards the lambdoidal suture; to the lower part of the orbit of the left eye, and even down the left arm. She said that it was impossible to describe the character of the



pain, as she had experienced nothing like it before. When the fingers were applied to the joint, and the lower jaw was at the same time opened and shut, a grating sensation was communicated to them, as if the articulating surfaces were deprived of their cartilages. There was no evident tumefaction. The patient did not complain of her sleep being much disturbed; nor did her general health appear to be considerably affected, though her pulse was as frequent as 96 in a minute.

The caustic potash was applied so as to make a slough of the skin below the ear, opposite the condyle of the lower jaw, on the anterior edge of the sterno-cleido-mastoideus muscle. She now returned into the country, where she was under the care of Mr. Pitman, of Andover, who removed the slough made by the caustic and kept open the issue in the usual manner.

After the issue had been established for five or six months, and not before, there was considerable relief from pain. On the 21st of August, 1822, Mr. W. Pitman wrote me the following account of our patient:—"At this time she has the perfect motion of the jaw, but there is still the same grating sensation when it is moved as there was formerly, though in a less degree. She has the power of masticating almost all articles of diet, which are not very hard. The condyle does not appear to be much reduced in size; when, however, the mouth is widely opened, as in yawning, our patient generally places her hand to support the jaw, as if fearful that it might slip out of its situation. With all this amendment, however, there is considerable pain occasionally; and as there has never been an absolute cessation of pain for more than three or four weeks at a time, the issue is still kept open."

CASE XLV.—A gentleman, twenty-four years of age, about the end of the year 1816, became affected with a slight pain in the left ankle; and he observed, also, that this pain was particularly aggravated, whenever any thing occurred to press the articulating surfaces of the joint against each other; for example, when he happened to tread with his heel on any projecting stone in the street. He also observed a very slight degree of puffy swelling on the anterior and outer part of the joint, before the external malleolus.

On the 6th of January, 1817, he went to a ball, and danced; and on the following day the pain was very much aggravated. The exercise also brought on some degree of general tumefaction about the joint; which, however, subsided with rest, in the course of twenty-four hours. But the pain continued and increased; so that he could not support the weight of his body on that foot, and he was compelled to walk with the assistance of one, and afterwards of two, sticks. In May following, a general puffy swelling took place round the whole joint, which did not subside.

On the 30th of June, 1817, he consulted me, being then in the following condition:—

There was some degree of general cedematous tumefaction of the whole joint, in consequence of slight inflammation of the cellular membrane external to it. There was a constant and severe pain referred to the ankle, which was rendered more violent, when he attempted to stand, and when the cartilaginous surfaces were pressed against each other, by the hand placed on the lower part of the heel. His rest was disturbed at night, by painful startings of the limb.

He had come to consult me at my own house; and in going home, he fell from his horse, and wrenched his ankle, which brought on inflammation, and rendered all the symptoms still more severe.

He was directed to remain at home, in a state of perfect quietude, and never to place the foot on the ground. Leeches and cold lotions were applied,

and the application of the leeches was repeated. Under this treatment the additional inflammation induced by the accident subsided; and the pain became much less severe. At the end of August, a blister was applied on each side of the ankle, and kept open by means of the savine cerate. After the first blisters were healed, others were applied, and kept open in the same manner; and in the intervals between the applications of the blisters the joint was bound up in strips of linen spread with soap plaster.

About the end of September he was so much relieved, that (having some concerns which it was of much importance to himself to attend to,) he was allowed to go out occasionally in a chaise.

On the 20th of December, a caustic issue was made behind the inner ankle. This occasioned exceeding irritation and uneasiness, and the issue was in consequence allowed to begin to heal, about a fortnight after the separation of the slough. He was, however, much benefited by the issue; and after it was healed, he was free from pain, and the swelling had subsided.

On the 23d of May, 1818, he was in the following condition. He was free from all pain; could bear the joint to be moved, and could support the weight of the body on that foot without inconvenience. There was still some slight remains of the external swelling. When the joint was moved, a grating sound could be heard; and if at this time the fingers were applied to the joint, a sensation was communicated to them, as if two hard and rough surfaces were rubbed one against the other.

CASE XLVI.—Mary Taylor, fifty years of age, was admitted into St George's Hospital, on the 3d of December, 1809.

She said, that in the preceding July she experienced a violent wrench of the right shoulder, in consequence of her husband having pulled her by the arm. Soon afterwards she was attacked with pain in this joint, which gradually became very severe. At the time of her admission into the hospital, there was no alteration in the external appearance of the shoulder. There was not the smallest evident swelling; but she complained of constant and violent pain, which was much aggravated by every attempt to move the arm. The pain was most severe at night, so as very much to disturb her rest. She was unable to lie on the side on which the disease was situated.

The arm was supported by a sling, and a blister was applied to the shoulder, and afterwards kept open by means of savine cerate.

In less than a fortnight the symptoms were much relieved. In the beginning of January, 1810, she had very little pain, and slept well at night.

About the middle of February she was dismissed from the hospital, being free from all her former symptoms. She was directed to attend as an outpatient, that the blister might be kept open for some time longer; however, she never made her appearance at the hospital again, probably in consequence of her finding no inconvenience from the complaint, and of her not being convinced of the necessity of continuing the treatment after the symptoms were relieved.

The following case is of considerable interest, inasmuch as it exhibits the disease in its acute form, attended with more urgent symptoms than those which usually mark its existence in the beginning; and also on account of the manifest resemblance which it bears to the case of Holder, in which the opportunity occurred of examining the state of the diseased parts.

CASE XLVII.—Sarah Hansell, forty-six years of age, was admitted into St. George's Hospital, on the 22d of August, 1822.

She labored under pain in the left knee, and a swelling extending up the lower part of the thigh, chiefly on the anterior part. There was no effusion



of fluid into the joint. The leg was bent at an acute angle with the thigh, and the patient was unable either to extend it, or bend it further. The pain in the knee was referred chiefly to the inside of the joint; it was very severe, especially at night, when it awoke her from sleep with startings of the limb. Every attempt to press the articulating surfaces of the joint against each other was productive of acute suffering, causing the patient to scream; and she could not even bear the weight of the bed-clothes on the limb. There was much symptomatic fever, with a countenance expressive of severe suffering. The tongue was white and dry, and the pulse small and frequent.

Eleven weeks previous to her admission, she had become affected with rheumatic pains in her wrists and ankles. In the course of a few days these pains subsided, but she was now suddenly seized with most severe pains in the left knee, accompanied by much fever. After two or three days more, the joint appeared to be swollen, first on the inside, then in front on each side of the ligament of the patella. The swelling attained a considerable size, but gradually diminished on the abstraction of blood by leeches and cupping. The pain, however, became progressively more severe.

She had been always subject to rheumatism; independently of which her health was good. The catamenia had ceased since the beginning of the attack.

August 24. She was directed to take two grains of calomel and half a grain of opium, in a pill, three times daily. Leeches were applied to the knee, and afterwards a blister.

August 30. The gums were affected by the mercury. The pain in the knee was much abated, and she slept better at night. General health much improved. She was directed to take a pill only twice daily.

September 8. The pain and swelling of the knee were much farther diminished. The gums continued sore. A blister was applied to the lower part of the thigh.

September 12. The mercurial pills were discontinued. Ten grains of the *pulvis ipecacuanhæ compositus* were ordered to be given every night, and an issue was made with caustic; one above and the other below the knee joint. The application of the caustic gave much immediate relief.

September 22. The pain was trifling, except when the joint was moved; and there were still some painful startings of the limb at night. The swelling was reduced, so that the joint had become of its natural size and figure. Her general health was much improved.

October 6. The symptoms were still further relieved, and the leg was gradually becoming more extended. The issues were kept open by the occasional application of the caustic potash. From this time her amendment was progressive. On the 8th of May, 1833, she quitted the hospital, the knee being ankylosed in the bent position. She still experienced slight pain occasionally in it.

I have before observed, that ulceration of the articular cartilages is not unfrequently complicated with inflammation of the synovial membrane.— Sometimes the one, and sometimes the other is the original disease; in like manner as we find ulcer of the cornea of the eye, in some cases the cause, and in others the consequence, of inflammation of the tunica conjunctiva. In the very advanced stage, when the organization of the joint is completely destroyed, this complication must always exist; and it is unnecessary to adduce evidence of this fact. But occasionally the two diseases are combined together in a more early stage, and previous to the establishment of suppuration.

The two following cases will serve to illustrate these observations. In one of them the ulceration of the cartilages appears to have been the primary, and inflammation of the synovial membrane, the secondary affection; at least the symptoms which occurred seem to be better explicable on this supposition than on any other. In the second case, the early symptoms indicated the existence of inflammation of the synovial membrane, and it was not until after these had subsided that there were any signs of ulceration of the cartilages.

CASE XLVIII.—John Child, thirty-three years of age, in April, 1814, was seized with a pain in one knee. The pain at first was slight, but gradually became very severe. It was referred principally to the head of the tibia on each side of the ligament of the patella. At the end of five months the joint for the first time became swollen, and the swelling soon attained a considerable size. He was now under the necessity of confining himself to his room. Five blisters were applied in succession, and the swelling and pain subsided; so that at the end of three weeks he returned to his usual occupations. In five or six days, however, the pain and the swelling returned, and he was in consequence admitted into St. George's Hospital on the 26th of October.

At this time he complained of pain in the joint, referred to the head of the tibia, on each side of the ligament of the patella. The pain was excruciating, so as often to keep him awake during the whole night. The knee was much swollen: the swelling arising from an effusion of fluid into its cavity, and having the same form as in ordinary cases of inflammation of the synovial membrane.

October 29. A blister was applied, including the greater part of the circumference of the joint.

November 7. The swelling and pain were relieved. Another blister was applied, which was kept open with the savine cerate until the end of the month. It was then healed, and a third blister was applied and kept open in the same manner.

On the 21st of December he left the hospital of his own accord. The pain at this time was very nearly, but not completely, relieved: the knee was swollen only in a very slight degree; and the trifling swelling which remained, appeared to arise, not from fluid within the articulation, but from thickening of the soft parts in consequence of their having been previously inflamed.

CASE XLIX.—Anne Donegan, twenty-seven years of age was admitted into St. George's Hospital in May, 1817, laboring under a disease of one knee.

The leg was bent at a right angle with the thigh, and the patient was incapable of altering its position. There was no effusion of fluid into the cavity of the joint, but there was a slight degree of swelling, apparently in consequence of an effusion of fluid into the cellular texture external to it. The joint was painful, and tender to the touch.

From the history of the case, it appeared that the disease had originated in one attack of inflammation of the synovial membrane, which had subsided and left the present symptoms.

Leeches were applied to the knee, and the limb was kept in a state of repose. In the beginning of June, there was a severe aggravation of the pain in the knee, and the leg became more bent, so as to make an acute angle with the thigh.

June 7. A blister was applied to the thigh immediately above the knee and an opiate was directed to be taken at bed-time.



The pain was at first relieved by the application of the blister, but on the 12th of June, it became again as severe as ever.

Another blister was applied to the inside of the knee, and directed to be kept open with the savine cerate.

June 18. The pain in the knee was excruciating: the leg continued bent at an acute angle with the thigh. The blister having healed, an issue was made with caustic on the inside of the joint.

The pain was much relieved immediately after the application of the caustic.

July 8. The pain in the knee, which had become much abated, being again severe, another issue was made with caustic over the outer condyle of the femur.

From this time the pain was entirely relieved. The issues were kept open.

October 6. The patient continued free from pain, and she could move the limb much more freely than before.

December 16. The motion of the joint was still very limited: but there was no pain, except when the leg was moved, so as to extend the adhesions which appeared to have been formed in the joint. She left the hospital.

## CHAPTER V.

ON A SCROFULOUS DISEASE OF THE JOINTS HAVING ITS ORIGIN IN THE CANCELLOUS STRUCTURE OF THE BONES.

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## SECTION I.

*Pathological Observations.*

THE term scrofula is often employed without much precision; and, indeed, it is not always easy to determine what symptoms ought, and what ought not, to be referred to this disease. It has been usual to regard nearly all the affections of the joints as scrofulous; and I believe it may be found that persons having a predisposition to scrofula, are, on the whole, more liable than others to those affections which form the subject of the preceding chapters. As, however, they occur very frequently, where no such predisposition exists, there seem to be no sufficient grounds for considering them as having any necessary connection with it; and it can be no more proper to designate these as scrofulous than it would be to denominate inflammation of the synovial membrane a mercurial disease, because it occasionally arises from the use of mercury. But there is another malady which affects the joints, having all the characters of scrofula: generally occurring in persons who have a scrofulous appearance, and usually preceded by, or combined with, other scrofulous symptoms.

In this disease of the joints, the cancellous structure of the bones is the part primarily affected; in consequence of which, ulceration takes place in the cartilages covering their articulating surfaces. The cartilages being ulcerated, the subsequent progress of the disease is in many respects the same as where the ulceration takes place in first instance.

CASE L.—Thomas Scales, aged eighteen, having a scrofulous appearance, was admitted into St. George's Hospital, on the 18th of October, 1815.

He complained of pain, which he referred to the inside of one foot. The pain was constant, but slight, and not sufficient to prevent his walking as usual. There was very little, if any tumefaction, and the parts were not tender to the touch. He was also in a general ill state of health: there were symptoms of derangement of the functions of the liver, and the urine was turbid, depositing a quantity of sediment, which stained the vessel that contained it of a pink color. He was heavy and stupid, and scarcely able to give any consistent account of his ailments. There were some small ulcerations at the edges of his eye-lids.

While he was under a course of remedies for these complaints, he was seized, in the beginning of February, 1816, with a fever, of which he died on the first of March.



On dissection, the foot, which had been the seat of the pain, was particularly examined. The bones of the tarsus, and metatarsus, were found to contain an unusually small quantity of earthy matter; so that they were preternaturally soft, and admitted of being cut in any direction with a scalpel, without turning its edge. The cut surfaces of these bones were of a deep red color, in consequence of increased vascularity; and vessels injected with their own blood could be distinctly traced extending from the bones into the cartilages covering them, and rendering the latter, in a few spots, of a red color. The cartilage covering the internal cuneiform bone, where it forms the joint with the metatarsal bone of the great toe, was ulcerated to a small extent. The ulceration had begun on that side of the cartilage which was connected to the bone; the surface towards the joint remaining entire. The bones of the tarsus were more diseased than those of the metatarsus; and those on the inside of the tarsus were affected in a greater degree than those on the outside. The bones of the other foot were affected in the same manner, but in a much less degree. Some of the other bones were examined, and were found nearly in a natural condition.

CASE LI.—December 21st, 1814. In a boy apparently about ten years of age, whose body I had the opportunity of examining after death, I observed the following appearances:—

Both elbows were slightly swollen. On the fore-part of the right arm, immediately above the elbow, there was the orifice of a sinus, which extended downwards obliquely into the cancellous structure of the bone, where it terminated, without communicating with the cavity of the joint. The cancellous structure of the articulating extremities of the os brachii, radius, and ulna, was so soft, that it might be crushed by a very slight degree of force when squeezed between the fingers; it was of a dark red color; preternaturally vascular, and there was a reddish fluid, mixed with medulla, in the cancelli. The cartilages covering the radius and ulna were in a natural state; that belonging to the os brachii was ulcerated in a few spots on the surface towards the bone, while the surface towards the cavity of the joint was entire. There were no morbid appearances of the ligaments or synovial membrane.

The bones of the left elbow were in a similar state of disease; the cartilages were entirely destroyed by ulceration; and carious surfaces of bone were exposed. A small portion of dead bone had exfoliated into the cavity of the joint, where it lay surrounded by matter. The synovial membrane and ligaments were extensively destroyed, and there were several sinuses communicating with the joint and opening externally.

On examining the right knee, which externally had not the slightest marks of disease, and admitted of perfect motion, the cancellous structure of all the bones which enter into its composition was found in the same morbid condition with that of the bones of the elbows, being preternaturally red and vascular, with a much less proportion than is usual of earthy matter, so that they admitted of being crushed by a very slight force. In the interior of the lower extremity of the femur, between the two condyles, there was one part where the earthy matter seemed to have entirely disappeared, and there was in consequence an irregular space in which there was little else than medulla and a reddish fluid mixed together; near this part, the cartilage had only a very slight adhesion to the bone, and ulceration had begun on its inner surface.

In several other joints, which were examined, there were marks of the same disease, but in a less advanced stage.

CASE LII.—John King, twenty-six years of age, having blue eyes, thick

lips, and a florid complexion, was admitted into St. George's Hospital, on the 1st of June, 1811, on account of a complaint in his right ankle and foot. I received the following account of his case, partly from himself, and partly from a medical gentleman, who was in the habit of seeing him before he came into the hospital.

About the end of May, 1810, he wrenched his foot. The instep and ankle became swollen and painful, but in a few days these symptoms subsided. During the summer he experienced slight pain and weakness of these parts, whenever he took more than his usual quantity of exercise. In October a slight tumefaction was observed on each side of the ankle, and the pain was more severe, but still not sufficient to prevent his going about his usual occupations. About the middle of December, the pain became more violent, and he was confined to the house for a fortnight; after which the pain abated, so that he was able to go about with the assistance of a crutch.

In March, 1811, an abscess burst on the outside of the foot. The formation of the abscess was not attended with any considerable degree of pain.

He formerly had been supposed to labor under incipient *phthisis pulmonalis*; but from the time of the disease having begun in his foot, he suffered no inconvenience from the complaint in his lungs.

At the time of his admission into the hospital, there was a diffused œdematous swelling of the soft parts over the whole foot and ankle. On the outside there were the orifices of three or four sinuses, which had burst at different periods. He had very little pain, even on motion or pressure. Soon after his admission, another abscess broke on the inside of the heel.

On the 11th of July, the leg was amputated.

On examining the foot, the cells of the cellular membrane were found distended with serum and coagulated lymph.

All the bones had undergone a morbid change, similar to what was observed in the last case, except that they were still softer and more vascular.

The cartilages of the ankle were completely destroyed by ulceration, and the exposed surfaces of bone were in a state of caries. The cartilages of the tarsus were entire, but, in some places, of a red color; and this was found to arise from vessels loaded with red blood, extending into them from the bone. The ligaments and synovial membranes of the tarsal joints were in a natural state, as were also those of the ankle, except where they had been destroyed by the abscesses.

CASE LIII.—This patient was a soldier in the Coldstream Guards. I once had an opportunity of seeing him before amputation was performed; and, through the kindness of the medical officers of the regiment, I was favored with the previous history of the complaint, and with the opportunity of examining the amputated joint.

William Miles, twenty years of age, of a delicate complexion, with red hair and dilated pupils, was attacked with a slight pain and swelling of the left knee, about the middle of January, 1808. On keeping quiet for a few days, the swelling subsided; but it returned about the end of March, though still attended with very little pain.

He was received into the hospital of the battalion at Chatham, and, on the 9th of June following, he was sent to the regimental hospital in London.

At this time the diseased knee measured in circumference three inches more than the other. Fluid was felt external to the joint, and in the cavity of the joint itself. The leg was kept extended, and all attempts to bend it gave considerable pain; but otherwise, the pain which he endured was tri-



fling, amounting only to a slight degree of uneasiness, deep-seated in the joint. On the 8th of July, an abscess burst near the inner edge of the patella, and discharged about eight ounces of thin pus. On the 27th of July, the limb was amputated.

On examining the knee, the articulating extremities of the tibia and fibula were found so soft, that they were readily cut by a common knife; they contained much less earthy matter than is usual, and their cancelli were filled by a yellow cheesy substance.

The cartilage covering the head of the tibia was destroyed by ulceration in a few spots at the margin. That of the femur was eroded for a very small extent behind the crucial ligaments. The patella, and the cartilage covering it, were in a natural state. Coagulated lymph, having a gelatinous appearance, had been effused into the cellular texture, on the outside of the synovial membrane. Pus was found external to the joint, and in the joint itself.

CASE LIV.—Charles Miller, twenty years of age, having blue eyes, light hair, and a fair complexion, was admitted into St. George's Hospital, in April, 1808, on account of a disease of one foot.

The whole foot was swollen and oedematous, with two fistulous sinuses, one on the inside, and the other on the outside, through which a small quantity of scrofulous matter was discharged. A probe having been introduced into either of these sinuses, some exposed pieces of bone might be distinguished.

On the 16th of May, the limb was amputated below the knee.

On examining the amputated foot, the muscles were found pale and wasted from want of use, and the cellular membrane was distended with coagulated lymph.

The extremities of the tibia and fibula, all the bones of the tarsus, and the extremities of the bones of the metatarsus, contained much less earthy matter than is usual. They were so soft, that they might be cut with a scalpel without the edge of it being turned. They were preternaturally red and vascular, and a yellow cheesy substance was deposited in the cancelli. The cartilage at the base of the fifth metatarsal bone was destroyed by ulceration. Those at the bases of the three middle metatarsal bones were also destroyed, and the exposed surfaces of bone were dead, and undergoing the process of exfoliation. The cartilages of all the other bones were in a natural state. Pus and coagulated lymph had been effused in the neighborhood of the dead and carious bones, and the sinuses communicated with them. The synovial membrane and ligaments were in a natural state, except where destroyed by ulceration.

CASE LV.—Ellen M'Millan, eight years of age, was admitted into St. George's Hospital, on the 6th of March, 1833.

She complained of pain in the right hip, extending down the thigh, and much increased by motion, or by pressing the articulating surfaces against each other. The foot was everted. The limb was of its natural length. She had been observed to limp in walking about six weeks ago, since which the symptoms had progressively increased.

In the beginning of April, while under treatment for the disease in the hip, she became affected with other symptoms, indicating the existence of disease in the brain; under which she sank and died on the 6th of April.

On examining the body, a scrofulous tubercle was discovered in the lower part of the right hemisphere of the cerebrum, and the vessels of the brain generally were found to be turgid with blood.

In the right hip, the cartilage of the head of the femur, in the neighborhood of the attachment of the round ligament, was found to have been destroyed

by ulceration, and of the round ligament itself scarcely any vestige remained. The cartilage of the acetabulum was also ulcerated to some extent at the lower part. The bone of the pelvis, where it forms the acetabulum, and the head and neck of the femur, were of a soft consistence, so that they could be divided by a knife; and there was a considerable deposite of yellow substance in the cancellous structure of the latter.

On examining the bones of the left hip, they were found to be effected in the same manner as those of the right hip, but they were in a less advanced stage of the disease.

The cartilage of the head of the femur was detached with unusual facility from the bone below, the surface of the latter presenting a highly vascular appearance; and, in two spots, the layer of the cartilage towards the bone was destroyed by ulceration, while that towards the cavity of the joint remained entire. The space thus formed between the cartilage and the bone was occupied by a vascular substance of the consistence of granulations.

CASE LVI.—A girl, fifteen years of age, was admitted into St. George's Hospital, in the winter of 1809, laboring under symptoms of disease of one hip, as well as of one elbow. After remaining some months in the hospital, she left it of her own accord in the beginning of August. In the following October she was readmitted with the disease both of the hip and elbow much advanced. There was a large abscess in the thigh; her general health was much impaired, and she sank and died in less than six weeks after her readmission.

On dissection, the abscess in the thigh was found communicating with the cavity of the hip-joint, through an ulcerated opening of the capsular ligament and synovial membrane. The cartilages of the hip had entirely disappeared; the bones were carious; the acetabulum had been rendered deeper and wider, and the head of the femur smaller than natural. The capsular ligament and synovial membrane were thickened, and a soft organised mass, similar to the substance of adhesions, was found adhering to the neck of the femur. The cancellous structure of the bones was softer than natural, so that it might be cut with a scalpel, or crushed between the fingers; and the appearance of it in other respects corresponded to that of the diseased bones in the cases which have been just related.

The disease of the elbow was similar to that of the hip-joint; but it had made less progress. The ligaments and synovial membrane of the elbow were nearly in a natural state, and some thin portions of cartilage still remained lying on the surface of the carious bone, but having little or no adhesion to it.

The preceding cases sufficiently illustrate the nature and progress of this disease. The morbid affection appears to have its origin in the bones, which become preternaturally vascular, and containing a less than usual quantity of earthy matter; while, at first, a transparent fluid, and afterwards a yellow cheesy substance is deposited in their cancelli.

From the diseased bone, we see, in some instances, vessels carrying red blood extend into the cartilage. The cartilage afterwards ulcerates in spots, the ulceration beginning on that surface which is connected to the bone. The ulceration of the cartilage often proceeds very slowly. I have known a knee amputated on account of this disease, in which the cartilage was absorbed, for not more than the extent of a sixpence. Occasionally a portion of the carious bone dies and exfoliates.

As the caries of the bones advances, inflammation takes place of the cellular membrane external to the joint. Serum, and afterwards coagulated lymph,



is effused, and hence arises a puffy and elastic swelling in the early, and an œdematous swelling in the advanced stage of the disease. Abscess having formed in the joint, makes its way by ulceration through the ligaments and synovial membrane, and afterwards bursts externally, having caused the formation of numerous and circuitous sinuses in the neighboring soft parts.

In one of the cases which have been related, thin layers of cartilage were found lying on the ulcerated surface of bone, apparently unconnected with it. In some instances, in the advanced stage of this disease, we find nearly the whole of the cartilage forming an exfoliation instead of being ulcerated.

This scrofulous affection attacks those bones, or portion of bones, which have a spongy texture, as the extremities of the cylindrical bones, and the bones of the carpus and tarsus; and hence the joints become affected from their contiguity to the parts which are the original seat of the disease. Sometimes, however, we may trace the effects of these morbid changes even in the shaft of a cylindrical bone; so that we see the femur or tibia converted in its middle into a thin shell of earthy matter, enclosing a medullary canal of unusual magnitude.

It has been remarked by a modern author,\* that, in the last stage of this disease, the bones not only lose the preternatural vascularity which they possessed at an early period, but even become less vascular than healthy bone. I believe the observation to be correct; and this diminution of the number of vessels, and, consequently, of the supply of blood, is probably (as this author has suggested) the proximate cause of those exfoliations which sometimes occur where the disease has existed for a considerable length of time, especially in the smaller bones.

## SECTION II.

### *On the Symptoms of this Disease.*

The scrofulous affection of the joints occurs frequently in children: it is rare after thirty years of age. Examples of it occur in almost every joint of the body; but the hip and shoulder appear to be, on the whole, less liable to it than many other articulations.†

As it depends on a certain morbid condition of the general system, it is not surprising that we should sometimes find it affecting several joints at the same time; nor, that it should show itself in different joints in succession; attacking a second joint after it has been cured in the first, or after the first has been removed by amputation. It is seldom met with, except in persons who have the marks of what is called a scrofulous *diathesis*: and in many cases it is either preceded, attended, or followed, by some other scrofulous symptoms; such as enlargement of the scrofulous glands of the neck and mesentery, or tubercles of the lungs. I have often been led to believe, that the occurrence of this disease in a joint, has suspended the progress of some other, and, perhaps, more serious disease elsewhere.

\* Lloyd on Scrofula, p. 123.

† Perhaps this arises from the circumstance of the hip and shoulder being less exposed to the influence of the external cold, which, in most instances, promotes the development of scrofulous diseases. So we find the scrofulous enlargement of the lymphatic glands to occur more frequently in the neck than in the groin or axilla; which last are generally protected by a warmer clothing.

The scrofulous disease is more likely to be confounded with that which formed the subject of the last chapter, than with any other. There is, in many respects, a correspondence in their symptoms. There are, however, certain points of difference; and I believe that this difference will be found in general, sufficient to enable the practitioner, who is careful and minute in his observations, to make a correct diagnosis; at least, in those cases in which the local disease is not so far advanced, and in which it has not so much affected the general constitution, as to make the diagnosis of no importance.

While the disease is going on in the cancellous structure of the bones, before it has extended to the other textures, and while there is still no evident swelling, the patient experiences some degree of pain; which, however, is never so severe as to occasion serious distress, and often is so slight, and takes place so gradually, that it is scarcely noticed.

After a time (which may vary from a few weeks to several months), the parts external to the joint begin to sympathise with those within it; and serum and coagulated lymph being effused into the cellular membrane, the joint appears swollen. The swelling is puffy and elastic, and though usually more in degree than it is at the same period in those cases, in which the ulceration of the cartilages occurs as a primary disease, it is not greater in appearance because the muscles of the limb are not equally wasted from want of exercise. I have observed that, in children, the swelling is, in the first instance, usually less diffused, and somewhat firmer to the touch than in the adult.

If a suspicion of some disease of the joint has not existed previously, it is always awakened as soon as the swelling has taken place. Should the patient be a child, it not uncommonly happens that the swelling is the first thing which the nurse or the parents discover. This leads to a more accurate inquiry and the child is observed to limp in walking, if the disease be in the lower limb, and to complain of pain on certain occasions.

I have said, that the swelling is puffy and elastic; and, after what has been remarked in the former chapters, it is needless to point out more particularly the difference between it and the swelling which takes place in cases of inflamed synovial membrane. The swelling increases, but not uniformly, and it is greater after the limb has been much exercised than when it has been allowed to remain for some time in a state of quietude.

As the cartilages continue to ulcerate, the pain becomes somewhat but not materially aggravated. It is not severe until abscess has formed, and the parts over the abscess have become distended and inflamed. The skin under these circumstances, assumes a dark red or purple color. The abscess is slow in its progress; when it bursts, or is opened, it discharges a thin pus, with portions of curdly substance floating in it. Afterwards the discharge becomes smaller in quantity, and thicker in consistence, and at last it nearly resembles the cheesy matter which is found in scrofulous absorbent glands.

In most instances, several abscesses take place in succession, but at various intervals; some of which heal, while others remain open, in the form of fistulous sinuses, at the bottom of which carious bone may be distinguished by means of a probe.

The disease not unfrequently remains in this state for several months, or even for a much longer period, without the constitution being materially disturbed by it. In the less fortunate cases the patient at last becomes affected with a hectic fever, under which he gradually sinks, unless the cause of it be removed by amputation. At other times, a curative process begins; the



sinuses close; the œdema subsides; and the patient ultimately recovers, either with or without an anchylosis, accordingly as more or less destruction of the articulating surfaces has taken place. But the cure is always tedious, unless the disease has been arrested at a very early period. It is not uncommon to see a patient with a scrofulous joint, in a state of imperfect anchylosis, with a single sinus remaining open, and waiting for many years before even such a cure as anchylosis affords can be said to be completed. The chance of ultimate recovery is not the same in every articulation; and I have observed, that it is much less where the disease attacks the complicated joints of the foot and hand, than when it is situated in those which, though of a larger size, are of a more simple structure.

The principal difference which is to be observed between the symptoms which have been just described, and those which are met with where ulceration of the cartilages occurs as a primary affection, is in the degree of pain which the patient endures, and which is much less in the cases of the former than in those of the latter description.

It may, indeed, be a matter of surprise that, in cases of this scrofulous affection, the sufferings of the patient should be so little as they are found to be, in proportion to the quantity of local mischief. For the most part, the pain which he experiences is not a subject of serious complaint, except at the time when an abscess is just presenting itself underneath the skin; and then it is immediately relieved by the abscess bursting. There is not that severe pain, which exhausts the powers and the spirits of the patient, in cases of ulceration of the cartilage, arising from other causes, except in a very few instances, and in the most advanced stage of the disease, when a portion of the ulcerated bone has died, and, having exfoliated so as to lie loose in the cavity of the joint, irritates the parts with which it is in contact, and thus becomes a source of constant torment.

There are other circumstances besides the less degree of pain, which, although not in themselves sufficient, it is useful to take into the account in forming our diagnosis; such as the general aspect and constitution of the patient, and his having manifested a disposition to other scrofulous symptoms; the very tedious progress of the disease; and the circumstance of the suppuration not being in general confined to a single collection of matter, but producing a succession of abscesses.

The progress of this disease in the hip very much resembles that of the disease which was described in the last chapter. Whatever pain exists is referred to the knee rather than to the joint actually affected. There is the same alteration in the appearance of the nates; the same apparent elongation of the limb in the early stage; and the same shortening of it at a more advanced period. Dislocation occasionally takes place in the direction upwards and outwards: in one instance only I have seen it in the direction forward, the head of the femur resting on the pubes, and the knee and toes being turned outwards. The shortening of the limb, whether it be from destruction of bone or actual dislocation, is followed, as in other cases of diseased hip, by the formation of abscesses, which present themselves in the usual situations. Yet, notwithstanding all these points of resemblance, attention to the points which have been already noticed, and especially to the quantity of pain which the patient has endured, will, for the most part, enable us to distinguish the real nature of the case. A girl labored under an affection of the hip-joint, in which the nates were flattened, the limb had become shortened, and an abscess had broken on the outside of the thigh; but it was observed that she had suffered comparatively little pain. Under

these circumstances she died ; and, when I was about to examine the body, I observed to those who were present, that there was little doubt but that the origin of the disease would be found to have been, not in the cartilages, nor in the bony surfaces to which they are connected, but in the cancellous structure of the bone. The appearances which were observed verified this remark. The cartilages were ulcerated, and the bones themselves destroyed to some extent. The latter were soft, so that they might be cut with a scalpel ; and, on dividing the articulating extremity of the femur longitudinally, a considerable collection of thick pus was found in the neck of that bone, below the head, which either had not escaped at all, or had escaped in very small quantity, by oozing through the cancelli, which were interposed between it and the cavity of the hip-joint.

When the disease occurs in those joints which are more superficially situated, such as the knee and ankle, we may be further assisted in our diagnosis by observing the character of the swelling by which it is accompanied, and which is somewhat peculiar, especially in children, previously to the formation of abscess. It is then limited to the immediate vicinity of the affected part, and has a pretty well defined margin. When the disease is in the knee, the child usually keeps the leg a good deal bent, and the condyles of the femur are seen projecting, of a somewhat globular form, and appearing as if they were actually enlarged, although we know them to be not enlarged in reality. Altogether, however difficult it may be to describe it in words, the appearance is very characteristic ; so that, judging from it alone, an experienced surgeon will, in many instances, be able at once to form a correct diagnosis.

### SECTION III.

#### *On the Treatment.*

In attempting the cure of the scrofulous disease of the joints, it is necessary to bear in mind, that it depends on a certain morbid condition of the general system. It seems reasonable to expect that, when the local affection has once begun to exist, local remedies may be of service in checking its progress ; but that, with a view to the ultimate result, such remedies as operate on the constitution of the patient may be of as much, if not of more, importance, than any local treatment.

I cannot say, that the abstraction of blood from the neighborhood of the diseased joint is never useful ; but it certainly is not necessary in ordinary cases. The state of the cancellous structure of the bones approaches to that of inflammation, and the cartilages have the appearance of being inflamed, before they begin to ulcerate ; but the inflammation is of a specific kind, and, like scrofulous inflammation in other parts, is not likely to be relieved by the loss of blood in the same degree as common inflammation.

Leeches and cold evaporating lotions may, however, be employed with advantage for the purpose of arresting an accidental attack of inflammation induced by too great exercise of the joint, or in any other way.

It rarely happens that any benefit is to be obtained from the application of blisters or liniments ; and, indeed, this observation may be extended to the whole of that class of remedies which are known by the name of counter-irritants. I much doubt whether setons and issues are ever useful, except in



some cases in which the disease has its seat in the hip-joint, and in which the patient suffers, in an unusual degree, from pain and muscular spasms in the limb, apparently in consequence of the irritation communicated to the trunk of the anterior crural nerve.

There is, however, one rule respecting local treatment, which is applicable to all cases, and which can never, with safety, be disregarded. The diseased joint should be kept in a state of the most perfect quietude. All motion and pressure of the articulating surfaces against each other is likely to promote the ulceration of the cartilages, and hasten the formation of abscess. We cannot suppose that rest will contribute to the restoration of the bones affected with scrofula to a healthy condition ; but it may do much towards preventing the disease extending to the other textures. With respect to the best mode of attaining this important object, it is unnecessary for me to offer any observations in this place ; the subject having been already fully discussed in former chapters.

During the formation of abscesses, fomentations and poultices may be employed, with a view to hasten their progress, and relieve pain ; and they may be continued for some time after the abscess has burst ; or simple dressings may be applied, according to circumstances.

When, after several abscesses have taken place, the disposition to suppuration appears at length to have ceased, and the swollen joint has become diminished in size, it may be expected that a curative process, by means of ankylosis, is about to commence. At this period, pressure by means of strips of linen, spread with soap cerate, or some other moderately adhesive plaster, and applied in a circular manner round the limb, will be productive of benefit. This will promote the healing of the sinuses ; and, by more completely preventing the motion of the joint, will lessen the chance of fresh suppuration, and favor the union of the ulcerated bony surfaces.

If a portion of the bone has lost its living principle, and has exfoliated into the cavity of the joint, the chance of ultimate recovery is very much diminished. For the most part, the dead bone is so entangled in the living parts, that it is incapable of separation by a natural process ; and every attempt to remove it by artificial means will occasion a fresh attack of inflammation and abscess. It is to be observed, however, that bone which is found exposed at the bottom of a sinus is not necessarily doomed to exfoliate. It may be simply ulcerated, and may possibly granulate, and recover ; and the surgeon, therefore, is not warranted in giving a prognosis which is decidedly unfavorable, merely because he discovers a piece of exposed bone, when he makes an examination with a probe.

With respect to the constitutional treatment ;—It is to be supposed that the air of a crowded city must be more or less unfavorable ; and that a residence on the sea-coast is likely to be more beneficial than a residence in the country elsewhere. The patient should live on a nourishing but plain diet ; he should be in the open air in summer, as much as he can be, without exercising the joint. His mode of life should, in all respects, be regular and uniform.

It is more difficult to appreciate the value of medicines in a disease which is so completely chronic, than in acute diseases ; but, of those which I have tried, it has appeared to me that preparations of steel are much more useful than any others. They must, however, be continued, with occasional intermissions, for a great length of time ; for two or three years, or even for a longer period. Of course, the operation of them must be carefully watched ; purgatives should be occasionally exhibited ; and the use of the steel should

be suspended wherever a furred tongue or a hot skin indicates that the system is not in a fit state to receive it. Other tonics are useful also, especially light bitters, combined with the *liquor potassæ*; or the latter may be given separately in small beer, or in the infusion of cloves. The mineral acids may be exhibited when there is a disposition to night-sweats, or loss of appetite. I have no doubt that the iodine is productive of benefit in some of those cases; but, according to my experience, it is so only when given in very small doses. The large doses in which the majority of medical practitioners in this country are in the habit of administering this medicine are, as I believe, not only not beneficial, but actually dangerous; diminishing, instead of improving the vital powers of the patient. The iodine cannot be taken constantly, and it may very properly be made to alternate with the courses of steel medicine; or, in some instances, the iodine and steel may be given with much advantage at the same time. In all cases, great attention should be paid to the state of the digestive organs; the patient's diet ought to be at the same time as plain and as nourishing as possible; and where the excretions appear to be unhealthy, it will be right to have recourse occasionally to mercurial alteratives. Mercury exhibited in larger doses is invariably prejudicial.

When the organization of the joint is completely destroyed, and the constitution has become affected, so that the patient's health is evidently failing, there can be no doubt of the necessity of the local disease being removed by amputation; but a question concerning the expediency of this operation will often arise under other circumstances. The patient has hitherto not suffered with respect to his general health, or has suffered in a very slight degree; the condition of the diseased joint is such that ultimate recovery is very doubtful, and it is certain that no better cure is to be expected than that by means of ankylosis, and even this cannot be looked for except after the lapse of a considerable time. Is the chance of the ultimate preservation of an imperfect limb sufficient to repay the patient for all the trouble, and pain, and anxiety, which he must undergo, in order that this object should be attained? Undoubtedly it is not, particularly with persons belonging to the lower classes of society, who have to support themselves by their bodily labor. There are, however, some other points to be taken into consideration; and altogether it is not so easy to determine respecting the propriety of an operation as, on the first view of the subject, it may appear to be.

A girl was admitted into St. George's Hospital, who labored under this disease in the bones and joints of the tarsus. Her foot was amputated by Mr. Griffiths. In about three weeks the stump was perfectly healed; but now she was seized with symptoms which indicated an affection of the mesenteric glands, which had not shown itself previously, and she died. On dissection, numerous glands of the mesentery were found enlarged, and containing a cheesy matter. Another girl, whose arm I amputated on account of a scrofulous disease of the elbow, became affected in the same manner immediately after the stump was healed. She also died, and similar appearances presented themselves on dissection. A man, whose leg was amputated on account of a scrofulous disease of the tarsus, in a short time after the operation began to experience symptoms which indicated the incipient state of some pulmonic complaint: and soon afterwards the other foot became affected in the same manner as the first. These are a few of many cases which might be adduced, as leading to this conclusion,—that the occurrence of this scrofulous disease, in a particular joint, may be the means of preventing the scrofulous disposition from showing itself in some other organ;



and that if the affected joint be removed by an operation, there is more danger of disease breaking out elsewhere, than there would have been if the operation had not been resorted to.

But we may refer to another order of facts, as showing, that there are occasions in which the amputation of a scrofulous joint, instead of rendering other organs more liable to the same disease, may actually produce the opposite effect of preserving them from it. It is to be observed that such a disease of a joint is never more than the remote cause of death, and that, where the result is fatal, it invariably happens in the following manner. The patient is exhausted by a hectic fever, and in this state of debility disease takes place in the mesentery or lungs, or not unfrequently in both these parts at the same time, and it is this visceral affection which immediately precedes dissolution. It is evident, then, that in many cases there is a period of time at which the amputation of the limb may be the means of preventing the establishment of a secondary disease. Nor is this all. Visceral disease which was previously in a state of inactivity, may assume a new form, and begin to make a rapid progress, under the influence of the disease of the joint; and amputation, under these circumstances, may be the means of preserving the patient, if not altogether, at least for a considerable time, perhaps for several years. A young woman was admitted into the hospital laboring under a scrofulous affection of the ankle. It was of long standing, and there were several abscesses communicating with extensive surfaces of carious bone. It was evident that there was no chance of cure for the disease in the joint. Nevertheless I did not think it right to propose to the patient that she should submit to the loss of the limb, as she had a troublesome cough, with a purulent expectoration, and other marks of pulmonary disease. She, however, earnestly implored that the ankle might be removed, and at her request, and certainly against my own judgment, I performed the operation. The stump healed readily. The pulmonary symptoms almost immediately subsided. She lived for four or five years in tolerable health, but at the end of that period, (as I have been informed,) there were again manifest indications of disease within the chest, of which she ultimately died.

It is evident, from these statements, that the question concerning amputation is, in many instances, one of a complicated nature, requiring the exercise of no small degree of judgment and discrimination on the part of the surgeon, and not to be determined, except after a minute investigation of the whole case, with respect to the disease in the joint itself, and also in whatever relates to the state of the general health at the time, and that of the constitution previously.

In cases, which have a more favorable termination, the joint is left in various conditions, accordingly as the disease had been more or less advanced at the period when its progress was arrested. If it has received a very early attention, the functions of the joint may be wholly unimpaired; the ulcerated surfaces being cicatrised without the formation of adhesions. Under these circumstances the place of the cartilage, which has been absorbed, is supplied by a membranous substance, and I am not justified in asserting that this may not be capable of assuming ultimately the true cartilaginous structure.

In other instances, adhesions are formed between the articulating surfaces; and as these are of greater or less extent, so are the functions of the joint more or less impaired. Whatever may be the degree of mobility which it retains, it is generally to be regarded as so much advantage to the patient, but not always. For example; in the joint of the knee it is not uncommon to find the patella completely united to the condyles of the femur, while the

head of the tibia admits of a considerable degree of flexion and extension. This partial degree of mobility is productive of no small degree of inconvenience, and the patient would, in fact, be in a much better state if the ankylosis were complete in every part, as, in consequence of the fixed state of the patella, he has no power to act on the leg by means of the extensor muscles. The joint is indeed movable, but its motions are not under the control of the will.

When recovery takes place, after the formation of an abscess communicating with the joint, the bones are every where united by adhesions, and there is complete ankylosis. Bony ankylosis, however, is rare in this disease, and at any rate is not established until after the lapse of many years. It is never prudent to have recourse to any mechanical means for the purpose of preventing ankylosis taking place, lest a fresh attack of inflammation and abscess should be the consequence. We may, however, venture, when the circumstances of the case require it, to adopt measures for the purpose of gradually placing the limb in a more commodious position. For example; when the knee has been affected, if left to itself, it often happens that the leg becomes fixed at a right, or even an acute angle with the thigh; and a light apparatus may be applied to the limb, with a screw at the posterior part, by the agency of which the leg may be very slowly and cautiously extended. In like manner, if the elbow be in danger of being ankylosed in the straight position, it may be very gradually brought into a state of flexion. It is scarcely necessary to explain wherefore, in the knee joint, the straight position is to be preferred to the bent; while in the elbow it is desirable to obtain the latter position instead of the former.

#### SECTION IV.

##### *Cases of this Disease.*

Several of the cases related in the first section will serve to explain the principal circumstances of this scrofulous affection of the joints in its most aggravated form.

The following exhibit it in its less advanced stages, where it is still capable of a cure. It may be presumed that in these cases, the original disease was that morbid condition of the cancellous structure of the bones which has been just described, since the symptoms exactly corresponded to those which have occurred in other cases, which have been proved by dissection to be of this nature.

**CASE LVII.**—William Moulds, six years of age, having a scrofulous aspect, was admitted into St. George's Hospital, on the 23d of February, 1814.

His left knee was an inch and a half in circumference larger than the other. The swelling was puffy and elastic; without fluctuation: having nearly the form of the articulating extremities of the bones; but filling up the space on each side of the ligament of the patella. The joint admitted of considerable motion, but not of complete flexion and extension. He complained of pain, which was worst at night; but never very severe. It was somewhat aggravated by pressure.

His parents attributed the complaint to some trifling hurt, which he had met with a year ago: soon after which, a slight degree of pain and tumefaction was first observed, which had continued ever since, and had increased, particularly within the last month.



On his admission, with a view to the relief of the external inflammation, blood was taken from the knee by means of leeches and cupping. A cold lotion was applied; and he was directed to take  $\mathfrak{z}\text{i}$ . of the *vinum ferri*, with a few drops of the *tinctura ferri muriatis*, three times in the day. On the 3d of March, the knee was bound up in strips of linen spread with soap cerate, chiefly with a view to restrain the motion of the diseased joint, without interfering with the patient's taking exercise.

March 20. The swelling was somewhat diminished; and he did not complain of pain.

April 1. He was in all respects better. As the former preparations of iron had begun to disagree with him, they were changed for ten grains of the carbonate, given three times in the day.

April 20. Scarcely any swelling of the joint remained; and there was no pain or stiffness. He quitted the hospital.

CASE LVIII.—A. B, a handsome boy, having blue eyes, and light hair, in the year 1806, had a scrofulous enlargement of some of the glands of his neck, which suppurated and burst.

In the month of June, 1810, being then eight years of age, he was observed to limp in walking; but he did not complain of pain, and little notice was taken of this circumstance.

In the beginning of December, 1810, some degree of tumefaction was observed of the left instep and ankle. About the end of this month he received a trifling hurt of these parts; and now the pain of the ankle, which before had been so slight that he scarcely spoke of it, became more considerable, and he was unable to walk. A gentleman who was consulted, directed the application of blisters, but they were productive of no relief.

In the middle of January, 1811, when I was first consulted, there was a puffy elastic swelling on each side of the ankle and instep; there was scarcely any pain when the joint was perfectly quiet; but on attempting to use it, the pain was more considerable, and it was particularly aggravated when the heel was pressed upwards against the bones of the leg. In other respects he was in perfect health.

I directed him to take the sulphate of iron internally, and to avoid all exercise of the joint, walking only on crutches, and so as never to place the foot in contact with the ground. Strips of linen spread with soap cerate were applied, for the purpose of more effectually restraining motion.

I did not see him again until the beginning of March, when the pain and swelling were found to be somewhat diminished. As the strips of soap cerate did not seem sufficiently to answer the intended purpose, a light pasteboard splint was applied on each side of the leg and foot, and secured by means of a bandage.

April 12th. The puffy swelling was evidently diminished, and there was no pain, even when the heel was pressed upwards against the tibia. The same treatment was continued.

May 26th. The swelling was further diminished; and, on the 29th of June, the affected foot and ankle scarcely differed in appearance from the other. He was free from pain even on motion. The splints were left off, but it was directed that he should continue to wear the bandage. He was allowed occasionally to put his foot on the ground.

July 20th. He continued well. He went to the sea-side, with directions to continue the steel medicine, and to bathe in the sea twice in the week.

CASE LIX.—George Lavel, nine years of age, and having a scrofulous appearance, in January, 1817, complained of an aching in his left elbow, and

in about two or three months it was observed that the elbow was swollen. In May, 1817, he became an out-patient of St. George's Hospital. At this time the elbow was swollen, and painful, but the pain arose chiefly from an abscess which presented itself underneath the skin on the inside. After the abscess had burst, it was observed that the swelling, so far as it was independent of it, was not considerable, and that it seemed to arise entirely from an effusion of serum and coagulated lymph into the cellular membrane external to the joint. From this time he suffered very little pain, until the beginning of January, 1818, when another abscess began to show itself on the outside of the elbow. On the 28th of January, he was received as an in-patient of the hospital. The joint now admitted of very limited motion. Whenever it was moved, or when the articulating surfaces were pressed against each other, he complained of some, but not of severe pain. He kept the fore-arm in the half-bent position, and walked about, supporting the hand in a sling, with very little inconvenience.

In the beginning of February, he was directed to take six grains of carbonate of iron three times in the day; and a purge of calomel and rhubarb was administered occasionally. The abscess was opened, and a poultice was applied.

March 1st. The joint was smaller, but he was feverish, and suffered pain at night.

March 21st. The swelling was much diminished, the pain had abated; he slept well at night, and was free from fever.

In the middle of May, there was a recurrence of pain in the joint, and another abscess presented itself on the outside, which was opened on the 19th of May. After this, a fourth abscess formed on the fore-part of the elbow, and broke on the 23d of June.

July 4th. There was little or no swelling. He was free from pain; the abscesses continued open, discharging a very small quantity of matter.

The poultices and fomentations, which had been hitherto employed during the formation of the abscesses, were now left off, and some simple dressings, and a bandage, were applied in their stead. The swelling continued to subside; he had no return of pain or abscess. On the 4th of September, the joint was not larger than the other; it admitted of much more motion than formerly; there was no pain; there was still one sinus, which was not completely closed, and which discharged a minute and almost imperceptible quantity of matter; all the other abscesses were completely healed.

The three preceding cases will serve to illustrate the history of this disease; but that which follows affords a better example of the treatment, which I have of late years been led to adopt for its relief, and which, according to my experience, is, on the whole, much more successful than any other.

CASE LX.—Master H. K., being at that time two years of age, was brought from the country for my opinion, concerning a disease in his knee, in the latter part of December, 1831.

The right knee was enlarged. The leg was half bent on the thigh, and the joint admitted of motion to only a limited extent. The swelling manifestly arose, not from fluid in the cavity of the synovial membrane, but from an effusion of lymph and serum in the cellular membrane external to it. The projecting condyles of the femur presented the usual rounded appearance which is observable in cases of the scrofulous disease of this articulation. The child complained very little, or not at all, of pain. There were no marks of derangement of the general health.

The enlargement and stiffness of the knee had been first observed about



the end of the preceding October, and had gradually increased up to the time of my being consulted. A pasteboard splint was applied on each side of the joint; the *vinum ferri* was prescribed to be taken twice daily for three weeks or a month, then omitted for a week or ten days, and then to be given for a month again, and so on. It was also directed, that some calomel should be administered once in three weeks, with an occasional dose of rhubarb and sal polychrest in the intervals; that he should be taken back into the country; that he should be drawn out of doors in an open carriage, so as to be exposed to the fresh air for some hours, daily, in fine weather; and lastly, that he should be prevented, as much as possible, from using the limb.

May, 1832. I saw the patient again in London. The disease had made no manifest progress. I recommended that he should go again into the country, and pursue the same plan of treatment in all respects.

Soon afterwards a swelling was observed, for the first time, on the inside of the thigh immediately above the knee.

September, 1832, the joint itself, appeared diminished in size, but the swelling on the inside of the thigh had increased. It manifestly contained fluid, and had all the appearance of an abscess. No alteration was made in the treatment.

In May, 1833, when he was brought to London, for the fourth time, the collection of fluid in the inside of the thigh was much reduced. The swelling of the knee was diminished also. The same remedies were directed as before.

In June, 1833, the swelling on the inside of the thigh had altogether disappeared. The diseased knee was scarcely larger than the other; but it was stiff, and the leg was bent at a right angle with the thigh.

It was now directed that the splints should be left off, and that an instrument should be applied at the back part of the limb, attached to the thigh and leg, so as to give much support to the joint, at the same time that it was furnished with a screw, by means of which the leg might be very cautiously and gradually extended. No change was made in the treatment in other respects.

The machine completely answered the purpose for which it was intended. In a fortnight after it was first applied, the little boy was able to walk across the room without difficulty, and altogether it was so convenient, that he was allowed to wear it during the night, by his own express desire.

In August, 1833, the leg was much straighter, and in other respects the joint was in a better state, than at any former period.

January 20, 1834. The knee was reduced to nearly its natural size. There were no perceptible remains of the swelling which had been supposed to be an abscess. The leg was bent only in a very slight degree, and the patella moved readily over the condyles of the femur. The little boy's health was good; he was free from pain, and he could walk tolerably well with the aid of the instrument. It was advised that he should return into the country, and continue on precisely the same plan of treatment as heretofore, except being allowed to exercise the limb more freely.

The following case is interesting in a pathological point of view, illustrating, as it does, the morbid changes which the disease produces in the various stages of its progress. It is, however, introduced in this place, as it shows to what extent the symptoms may be modified and aggravated by an accidental, and apparently trivial circumstance.

CASE LXI.—Captain D., in mounting his horse, some time in the year 1820, experienced an acute pain in the right hip, which was not however of long

duration. He afterwards felt occasionally, similar sensations which were induced by walking, but they were not severe, and therefore attracted very little of his attention.

In December, 1822, he was attacked with pain in the same hip, which did not subside as formerly. It occasioned lameness, so that he could not proceed many yards without stopping to rest. This pain increased; and in February, 1823, he suffered so much that he was wholly incapable of going from home, except in a carriage. He now consulted an eminent surgeon, who recommended the application of leeches, blisters, &c. One evening after the application of leeches, he had a paroxysm of violent pain, attended with spasmodic action of the muscles of the thigh. The pain, during this attack, was so excruciating, that, to use his own expression, he wished for immediate death. He took not less than 150 drops of laudanum before he obtained relief. From this time, however, he was never wholly free from pain; and he was also liable to repeated attacks of more intense suffering, attended with violent spasms of the muscles of the thigh. The slightest motion of the limb induced one of these attacks of spasm, during which the thigh was jerked in a most remarkable manner. He was in this state when I was first consulted, in the summer of 1823. In September, 1823, the spasmodic affection gradually subsided; and in the course of the October following a tumor presented itself on the anterior part of the thigh, in the situation of the femoral blood-vessels. The tumor appeared to contain fluid, and in one part of it a pulsation was perceptible, which might have led a superficial observer to mistake it for an aneurism. About the same time, he became affected with a cough, lost his appetite, was languid, and exhausted by the slightest exertion. Soon afterwards he expectorated pus, and died with symptoms of *phthisis pulmonalis*, on the 11th of December.

On examining the body after death, the lungs were found extensively diseased, containing tubercles, many of which were in a state of suppuration. The cartilages of the right hip were destroyed by ulceration, and the bones of the joint were in a state of caries. On making a section of the head of the femur, it was found to contain a less quantity of earthy matter than exists in a healthy bone, with a deposit of yellow substance in its cancellous structure. The synovial membrane and capsular ligament were considerably thickened, and a mass of coagulated lymph had been deposited round the neck of the femur. There was a collection of thin pus among the muscles on the anterior part of the thigh, below the hip-joint, but communicating with it. The tumor thus formed was of the size of a large orange, and being situated under the femoral artery, the latter was thereby raised out of its natural situation. There were two enlarged lymphatic glands, each of the size of a walnut, immediately below the crural arch, on the fore part of the joint, and these lay in contact with, and immediately behind, two branches of the lumbar nerves, so as to keep the latter on the stretch, like the strings passing over the bridge of a violin. This last-mentioned circumstance seemed to afford a reasonable explanation of the spasmodic affection to which the patient had been liable; and which probably had become relieved in consequence of some degree of diminution in the size of the glands after the escape of the abscess from the joint.

No disease had been supposed to exist in the left hip-joint previous to the patient's death. But, on examining it afterwards, the head of the femur was found to be softer than natural, so that it could be divided with a scalpel. In some parts the vascularity of the bone was preternaturally increased. In other parts the vascularity seemed to be less than natural, and a yellow



cheesy substance had been deposited in its cancelli. The synovial membrane and ligaments of the left hip were in a natural state.

In concluding this chapter, I have one further observation to offer, which may be of some importance to those who are engaged in studying the pathology and investigating the morbid anatomy of the joints. In the disease of which I have just treated, the bones are rendered preternaturally soft, so that they may be cut with a scalpel without turning its edge, or even crushed between the fingers. But this softened state of the bones is only one of the morbid changes which scrofula induces in these textures; and we are not hastily to conclude, where we meet with the bones thus deprived of their earthy matter, that this is always the original malady. In a patient who met with a compound fracture of the leg close to the ankle, and who died some time after the accident, I found, on dissection, the fractured surfaces in a state of caries, and the neighboring portions of the tibia and fibula as soft as they would have been in the most scrofulous subject. I have seen a number of other cases, which prove that a preternatural softness may occur as a consequence of inflammation and caries affecting a bone, which was previously in a healthy state. In cases of primary ulceration of the cartilage, the morbid appearances are at first confined to the cartilage and bony surface, to which it is connected. When the disease is further advanced; when the bones are extensively ulcerated, and inflammation has taken place in their substance; the earthy matter becomes absorbed, and the bones lose their natural hardness, so that they may be divided with little force. If we find the bones deprived of a large portion of their earthy matter, and this change connected with extensive destruction by caries, but without that effusion of serous fluid, and yellow cheesy substance into the cancelli, which has been formerly described, we may well doubt whether this morbid change be not the consequence, rather than the cause, of the caries with which it is combined. At any rate, it is to the examination of cases in which the disease is in its early stage, and not of those in which it has made great ravages, that we are to look chiefly for pathological information as to the nature of the morbid action which has taken place, and the particular texture in which it has had its origin.

## CHAPTER VI.

## ON CARIES OF THE SPINE.

## SECTION I.

*Pathological Observations.*

It is obvious, from the structure of the joints between the bodies of the vertebræ, that they can be liable to no diseases bearing any resemblance to the affections of the synovial membrane, which occur in other articulations. But analogy would lead us to expect, what experience demonstrates, that those diseases, which commence in the harder textures, may occur here as elsewhere, and that an extensive caries of the spine may have its origin, sometimes in an ulceration of the intervertebral cartilages, and at other times in a morbid condition of the cancellous structure of the bodies of the vertebræ.

In one of the cases which have been related in a former chapter, where ulceration of the articular cartilages had begun in several other parts, those between the bodies of some of the dorsal vertebræ were found to have been very much altered from their natural structure. I had an opportunity of noticing a similar morbid condition of two of the intervertebral cartilages in a patient, who, some time after having received a blow on the loins, was affected with such symptoms as induced Mr. Keate to consider his case as one of incipient caries of the spine, and to treat it, accordingly, with caustic issues; and who, under these circumstances, died of another complaint.

Opportunities of examining the morbid appearances in this very early stage of disease in the spine, are of very rare occurrence; but they are sufficiently frequent where the disease has made a greater progress; and in such cases, I have, in some instances, found the intervertebral cartilages in a state of ulceration, while the bones were either in a perfectly healthy state, or merely affected with chronic inflammation, without having lost their natural texture and hardness; while in others it has been manifest, that the original disease has been that peculiar scrofulous condition of the bones, the effects of which in the bones and joints of the extremities have been described at length in the preceding chapter.

The following cases illustrate the foregoing observations, and (if I am not mistaken) will be found to explain the whole of the pathological history of caries of the spine, with the exception of those circumstances which I shall have occasion to notice when describing the symptoms which the disease exhibits in the living person.

CASE LXII.—*Christiana Clear*, a girl eight years of age, was admitted into the Infirmary of the parish of St. George, Hanover Square, in the year



1808, on account of a disease of the spine. At this time, the upper part of the spine was bent forward, and the spinous processes of some of the dorsal vertebræ formed a preternatural projection at the posterior part; but still she was able to walk without assistance.

Soon after her admission, an abscess presented itself, and burst in the groin; and this was followed by a second abscess, which burst near the former.

The child was now under the necessity of being confined entirely to her bed. The abscesses continued to discharge pus. She became affected with hectic fever; nevertheless, more than two years elapsed from the time of her having been first admitted into the infirmary before she died.

The body was examined by Mr. Howship, to whom I am indebted for this account of the case. It was universally anasarcaous. The abdominal muscles were so wasted, that scarcely any vestige of them was perceptible. This probably arose from the circumstances of the child having remained in bed for so long a time previous to her death, and having scarcely ever varied her position.

At the posterior part of the abdomen, there was a confused mass of soft substance, which proved to be the parietes of an abscess communicating with the orifices in the groin.

The bodies of the lowest dorsal and three superior lumbar vertebræ, were found at the posterior part of the abscess, nearly consumed by caries. There were no remains of the intervertebral cartilages between the tenth and eleventh dorsal, nor of those between the third and fourth lumbar vertebræ. These intervertebral spaces were filled with pus, and the opposite surfaces of the vertebræ were carious, but only to a small extent. The central part of the intervertebral cartilage between the ninth and tenth dorsal vertebræ had been completely absorbed, and pus was found in its place. Externally to this, the concentric layers of elastic cartilage were entire, though somewhat altered from their natural appearance.

CASE LXIII.—Mr. M., a young man, in the summer of 1816, became affected with pain in his back, and general debility, which he attributed to his having lain on damp ground, while in the Island of Ascension, in the preceding March. In the beginning of September he sailed for England, being compelled to return home, on account of the state of his health.

In February, 1817, he arrived in London; complaining of pain in the back, and numbness of the thighs. Soon afterwards, on examining the spine, it was observed that that part of it, which is formed by the dorsal vertebræ, was incurvated forward, and that there was an evident lateral incurvation also. After this, an abscess burst in one groin, and continued open, discharging a large quantity of matter. The lower extremities became imperfectly paralysed; he lay constantly on one side, with the thighs drawn forward, so that his knees nearly touched his chin, and never varied from this position. He lingered until the 10th of August, 1818, when he died.

On inspecting the body, I found an abscess, which occupied nearly the whole of the anterior surface of the spine, from the upper part of the posterior mediastinum as low as the pelvis, and which communicated with each groin, extending downwards in the direction of the psoæ muscles. In many parts, in consequence of the contact of the matter of the abscess, the bodies of the vertebræ, and even the heads of the ribs, were affected with a superficial caries.

There were no remains of the intervertebral cartilage between the fourth and fifth dorsal vertebræ, and the opposite surfaces of these two vertebræ

were consumed by caries to some extent, and hence arose the curvature of the spine forward; and they were consumed to a greater extent towards the left side than towards the right, and hence arose the lateral curvature.

The intervertebral cartilage between the eleventh and twelfth dorsal vertebræ had also entirely disappeared, and the opposite surfaces of these bones were in a state of caries; but this had not extended itself sufficiently to occasion any sensible loss of bony substance.

The intervertebral cartilages between the third and fourth, fifth and sixth, seventh and eighth, tenth and eleventh dorsal vertebræ, and also that between the twelfth dorsal and first lumbar vertebræ, were all found in a perfectly natural state towards the circumference; but in the centre they were of a dark color; and on the surfaces towards the bones they, as well as the bones themselves, were in a state of incipient ulceration, but without any appearance of pus having been secreted.

All the other intervertebral cartilages were, throughout their whole substance, in a natural condition; and the bones of the vertebræ every where had their natural texture and hardness. On laying open the theca vertebralis, the membranes of the spinal marrow were found adhering together, behind the space between the fourth and fifth dorsal vertebræ.

CASE LXIV.—Mary Price, sixteen years of age, was admitted into St. George's Hospital, on the 24th of December, 1828.

She complained of pain in the loins, which was aggravated by pressure made in the situation of the upper circular vertebræ, and by sitting erect.

She also complained of pain in the left hip, which was more severe during the night than in the day, and attended with painful startings of the limb. The pain extended from the groin downwards, and was aggravated by exercise, and by pressure on the great trochanter.

She was confined to her bed in the horizontal posture; and an issue was made with caustic in the left loin.

Under this treatment, the symptoms were almost entirely relieved. But she now began to complain of a cough, attended with pain in the chest, and difficulty in making a full inspiration. Soon afterwards she expectorated pus; and she died on the 18th of March.

On dissection, tubercles were found in the left lung, and there was a considerable abscess.

There was a small abscess lying behind the left psoas muscle, which communicated with a space between the fourth and fifth lumbar vertebræ, formed by the ulceration of the intervertebral cartilages and the adjoining surfaces of the vertebræ. The bones of the vertebræ retained their natural hardness, but were of a pale color, apparently in consequence of their possessing a somewhat smaller degree of vascularity than under ordinary circumstances.

In the left hip-joint the synovial membrane appeared to be a little more vascular than usual. In the neighborhood of the insertion of the round ligament the cartilage of the acetabulum had disappeared, but it had been replaced by a membranous substance, adhering to what would have been otherwise an exposed surface of bone. In another spot, at the upper part of the acetabulum, the cartilage had also disappeared, and the bone itself had become exposed. The bone, however, was hard and compact, and rather more elevated than the bone in the neighborhood so as to justify the notion that it had become cicatrised after having been in a state of caries.

CASE LXV.—Charlotte James, nineteen years of age, was admitted into St. George's Hospital on the 30th of May, 1821. About a month before her admission she had experienced pain in the loins, which was relieved by cup-



ping. At the time of her admission, she had violent pain in the left lower limb, from the hip to the foot; and soon afterwards she again complained of pain in the loins; about the same period a tumor presented itself in the loins, on the right side. Her constitution also became affected with hectic symptoms.

On the 2d of June the tumor was punctured, and sixteen ounces of pus were evacuated. Another abscess presented itself in the groin.

The hectic symptoms continued: she gradually sunk, and died on the 3d of August.

On dissection, the bodies of the three or four inferior lumbar vertebræ were found preternaturally vascular, and of a dark, and almost black color; but they retained their natural texture and hardness, and had undergone none of those changes, which mark the existence of the scrofulous affection of the bones. The intervertebral cartilages were in a natural state; but the body of one of the vertebræ was superficially ulcerated for about the extent of a sixpence on one side, towards the posterior part. A large abscess communicated with this ulceration, and occupied the situation of the psoas muscle of the left side, extending downwards to the groin.

CASE LXVI.—Edward Griffiths, forty-five years of age, was admitted into St. George's Hospital, on the 15th of April, 1818, on account of an abscess, which presented itself in the left groin. He said that, about four months before his admission, he had been seized with pain in the loins, and that the tumor in the groin had appeared about six weeks after the commencement of the pain.

He was directed to remain constantly in the horizontal position; and in a short time the tumor formed by the abscess in the groin disappeared, and another showed itself over the left *os innominatum*. On the 15th of May, this abscess was opened, and about forty ounces of pus was discharged. After this, he gradually sunk, and died, worn out by a profuse suppuration, on the 19th of August following.

On dissection, it was found that the cancellous structure of all the dorsal and lumbar vertebræ was of a dark red color, and softer than natural, so that they might be cut with a common scalpel, or even crushed by the pressure of the thumb and fingers.

The opposite surfaces of the bodies of the second and third lumbar vertebræ, and of the cartilage between them, at the posterior part were extensively destroyed by ulceration. Anteriorly, the bones and the intervertebral cartilage were entire, and the latter was in a perfectly natural state; but the bones throughout were of a dark and almost black color.

On one side of the body of the twelfth dorsal vertebra, there was a small ulcerated spot, forming an opening which extended itself into a small cavity into the centre of the bone. This bone was also of a black color; but the intervertebral cartilages belonging to it, as well as the intervertebral cartilages connected with the other vertebræ, were in a perfectly natural state.

The abscess had originated in the carious surfaces of the second and third lumbar vertebræ, and had extended itself behind the left psoas muscle, as low as the upper and anterior part of the left thigh; where it made a turn backwards on the inside of the tendon of the psoas, and thus made its way to the place where it was opened on the posterior part.

The ribs were throughout unusually vascular and brittle, so that they might be broken by the slightest force. There were vomicae in the lungs, and tubercles in the liver.

CASE LXVII.—Henry Shaw, seventeen years of age, consulted Mr. Earle

in November, 1816, on account of a complaint which had begun about three months before, and of which the following were the most remarkable symptoms:—

He had frequent attacks of pain in the head, attended with giddiness. Occasionally he had fits, in which he was for a short time insensible, with a spasmodic action of some of the muscles of the neck. The right eye was amaurotic, and there was constant tinnitus aurium. His mental faculties were for the most part unimpaired.

By Mr. Earle's directions, he was cupped; purgatives were administered, and he was kept under the influence of mercury during six weeks, at the end of which time his symptoms had nearly disappeared.

About the end of May, 1817, he went on a visit into the country; and while there, he one day tripped and fell in crossing the room. Another set of symptoms now showed themselves, for which he was brought to London. At this time he had pain in the back and in the right side, shooting in the direction of the costal nerves. He was subject to severe cramps in the stomach; his bowels were irregular; and he breathed with difficulty. He had cramps in his lower limbs, and his locomotive powers were impaired, though there was no actual paralysis of the muscles. His general health was much deranged. On examining the spine, Mr. Earle discovered a curvature, of which the convexity was turned backwards, occupying about the three middle dorsal vertebræ; and this was attended with a considerable alteration in the form of the chest. He was now removed into St. Bartholomew's Hospital, where Mr. Earle directed him to remain constantly in the horizontal position, and an issue was made with caustic on each side of the spine. In a short time he lost the cramps of his lower extremities; but his general health continued to fail, and the difficulty of breathing increased.

In the middle of December he quitted the hospital. The exertion of being moved seemed to aggravate the disease. He was seized with numbness of the left leg and thigh; the dyspnoea became worse; and he sunk and died in convulsions, on the 23d of December, 1817.

On dissection, the arachnoid membrane was found opaque and thickened.

A large tumor, of almost cartilaginous hardness, was found in the anterior lobe, and a similar one in the posterior lobe, of the right hemisphere of the cerebrum; and a third tumor occupied the greater part of the right lobe of the cerebellum. The ventricles were distended with water.

The right lung was studded with tubercles, and adhered universally to the pleura costalis. There was a large abscess of the posterior mediastinum; at the bottom of which, the bodies of two of the vertebræ, together with the intervertebral cartilage between them, were found nearly destroyed by ulceration. The other intervertebral cartilages were in a natural state; but the bodies of the vertebræ were soft, and many of them were beginning to ulcerate. The ribs were porous, their cancelli being filled with a curdly matter; and they were soft, so that they might be divided with a scalpel. Four of the ribs were separated from their attachment to the spine, and were ulcerated as far as their tubercles.

It is unnecessary for me to adduce other cases of caries of the spine in which I had the opportunity of examining the appearances after death, and which did not essentially differ from those already related. The pathological history of the disease may be thus briefly recapitulated.

In some instances it has its origin in that peculiar softened, and otherwise altered condition of the bodies of the vertebræ, the appearance of which, in the bones belonging to other joints, has been described in the last chapter,



and which seems to be connected with what is called a scrofulous state of constitution. In these cases ulceration may begin on any part of the surface, or even in the centre of the bone, but in general the first effects of it are perceptible where the intervertebral cartilage is connected with it, and in the intervertebral cartilage itself.

In other cases the vertebræ retain their natural texture and hardness, and the first indication of the disease is ulceration of one or more of the intervertebral cartilages, and of the surfaces of bone with which they are connected.

There is still another order of cases, but these are of more rare occurrence, in which the bodies of the vertebræ are affected with chronic inflammation, of which ulceration of the intervertebral cartilages is the consequence.

In which ever of these ways the disease begins, if not checked in its progress, it proceeds to the destruction of the bodies of the vertebræ and intervertebral cartilages, leaving the posterior parts of the vertebræ unaffected by it; the necessary consequence of which is, an incurvation of the spine forward, and a projection of the spinous processes posteriorly.

At this period of the disease the membranes of the spinal chord sometimes become affected with a chronic inflammation, which may extend even to the spinal chord itself; and where there is much incurvation, the latter not only becomes incurvated with it, but actually compressed in such a manner as cannot fail to interfere with the due performance of its functions.

Suppuration sometimes takes place at a very early period; at other times, not until the disease has made considerable progress. The soft parts in the neighborhood of the abscess become thickened and consolidated, forming a thick capsule, in which the abscess is sometimes retained for several successive years, but from which it ultimately makes its way to the surface, presenting itself in one or another situation, according to circumstances.

In the advanced stage of the disease, new bone is often deposited in irregular masses on the surface of the bodies of the neighboring vertebræ, and where recovery takes place, the carious surface of the vertebra above, coming in contact with that of the vertebra below, they became united with each other, at first by soft substance, afterwards by bony anchylosis. The disposition to anchylosis is not the same under all circumstances: it is much less where the bones are affected by scrofula than where they retain their natural texture and hardness; and this explains wherefore, in the former class of cases, a cure is effected with more difficulty than in the latter.

Occasionally, portions of the ulcerated or carious bone lose their vitality, and, having become detached, are found lying loose in the cavity of the abscess. It is scarcely necessary to add, that the existence of such exfoliations is of itself almost sufficient to preclude all chance of the patient's recovery.

The foregoing observations are intended to apply to cases of caries of the spine originating in the spine itself: but those who are engaged in investigating the morbid anatomy of this disease, will find it necessary to distinguish between these and other cases, which may at first appear to be of a similar, but which are in reality of a different nature. The long-continued pressure of an abscess which has originated in the neighboring soft parts; of an aneurysm of the aorta; of a mass of enlarged lymphatic glands, or of any other tumor; may produce ulceration of the bodies of the vertebræ: and here we find the intervertebral cartilages in general to be very little, or not at all affected; so that they are left projecting nearly or quite of their natural size, while the bones themselves are in a great degree consumed. In such cases, where the spine is carious in consequence of disease beginning external to it, the symptoms are not the same as where it has begun in the spine

itself. For the most part, the affection of the spine is not suspected during the patient's life-time; and after death it is easy to trace the origin of the disease in the contiguous parts.

Not unfrequently, however, we find caries from disease of the spine itself complicated with caries from external pressure. For example, disease of the vertebræ, or intervertebral cartilages, occasion caries, and this is followed by the formation of abscess. The matter having become accumulated in considerable quantity, the abscess occupies a large space; and by its pressure on the surfaces of the vertebræ in the neighborhood, causes an extensive caries of them far beyond the boundaries of the original disease.

## SECTION II.

### *On the Symptoms of Caries of the Spine.*

As these diseases of the spine correspond in this respect, that they terminate in a more or less extensive caries, it may be expected that there must be a certain degree of resemblance in the symptoms which they produce. This resemblance is, indeed, greater than where the same morbid affections take place in other joints. I suspect that, where the disease is of scrofulous origin, affecting the cancellous structure of the bones, it is more immediately followed by suppuration, than where it commences in the form of ulceration of the intervertebral cartilages; and that in cases of the latter description the pain and tenderness in the situation of the carious portion of the spine, is more considerable than in those of the former. But farther than this, nothing, which I have hitherto observed, enables me to point out any circumstances, in which the symptoms of these different diseases differ; nor do I believe (however desirable it may be to do so), that it is possible, in the present state of our knowledge, to distinguish them from each other, with any degree of certainty, in the living person. Perhaps future observations may throw light on this important subject. In the meantime, when I speak of the symptoms of caries of the spine, it is to be understood that the observations which I make are, as far as I know, applicable to the various cases of this description; those only excepted, in which the caries is a secondary affection, the consequence of the pressure of a tumor in the neighborhood.

Caries of the spine usually occurs in those who are either originally of a weak constitution, or whose bodily powers have become diminished under the influence of some previous ailment. Thus we find it following scarlet fever, small-pox, a simple continued, or rheumatic fever, or a protracted or ill conducted mercurial course. In some cases, however, it takes place under very different circumstances, and individuals are attacked by it, who were previously in a state of perfect health.

It is evident that, independently of the effects which, in its most advanced stage, it produces on the general system, two orders of symptoms may be the result of this disease. 1st. Those which are the immediate consequence of the morbid condition of the vertebræ themselves, and of the intervertebral cartilages. 2dly. Those which arise from pressure on the spinal chord, or from irritation, propagated in some way or another to this important part of the nervous system, or to the nerves to which it gives origin; and these symptoms may be thus briefly enumerated:—

1st. Pain and tenderness in the situation of the carious vertebræ.

2dly. Curvature of the spine forward, with an angular projection of the



spinous processes posteriorly, the result of the bodies of the vertebræ having been destroyed, while the other parts of these bones remain entire.

3dly. Abscess commencing imperceptibly, but at last presenting itself as an external tumor.

4thly. Pains, loss of sensation, coldness, muscular spasms, and paralysis of the extremities.

5thly. Derangement of the functions of the various viscera, which are capable of being influenced by that portion of the spinal chord which is implicated in the disease.

But the whole of these symptoms are not met with in every instance; nor do those which actually exist always show themselves in the same order. They are modified and altered according to a variety of circumstances, and to such an extent, that a history of them, which is applicable to one case, may be found to be wholly inapplicable to another. In fact, there is scarcely any disease which presents itself under a greater number of forms, or in which, in the early stages, at least, so much experience and discrimination are necessary to enable us to form a right diagnosis.

In the majority of cases, the first symptom which the patient notices, is pain referred to that part of the spine in which the caries exists; at first trifling, but becoming more severe afterwards. The pain is aggravated by any sudden motion of the spine; by percussion, or by a jar communicated to it in any other way; as by stamping on the ground, striking the foot accidentally against a stone, sneezing or coughing. In the advanced stage of the disease the pain is sometimes so severe, and so easily induced, that the patient cannot bear the slightest movement. Yet, in other cases, there is sometimes no pain in the spine whatever, from the first access of the disease to its termination. I was consulted concerning a young gentleman, in whom, judging from the degree of distortion, I was satisfied that the bodies of not fewer than four or five of the dorsal vertebræ must have been wholly destroyed, and that the disease had been going on for several years: yet he had never been known to complain of pain; and the first circumstance which attracted the attention of the parents, was the angular projection of the spinous processes. This patient ultimately died, and on examining the body after death, a large abscess was discovered lying on the surface of the carious vertebræ. In another case, in which the disease was supposed to have been cured, and the patient had not experienced pain for the two or three preceding years, on examining the appearances after death, I found the bodies of the vertebræ still in a state of caries, and an abscess, containing not less than half a pint of matter, connected with them.

The distortion of the spine, which occurs in these cases, is of a peculiar kind. It is bent forward, so as to form an angle projecting posteriorly; and it is evident that this cannot happen without the destruction of the bodies of one or more of the vertebræ.

It is not less evident that the caries must have made considerable progress before this symptom shows itself; and, accordingly, we find that it has been preceded by pain, referred to the affected part, during a period which varies from three months to two years, and which is sometimes even longer than this. I have already mentioned that there are exceptions to this general rule, but these are of rare occurrence; and where pain in the early stage of the disease is wanting, there is usually some derangement of the general health, weakness of the extremities, or other symptoms, showing that the patient labors under some kind of disease, without indicating its exact nature and locality.

In general, the curvature is at first only just perceptible, and, by degrees, it becomes more distinct. In one instance, a young woman, who had made no previous complaints, immediately after some slight exertion, experienced a sensation as if something had given way in her back, and immediately afterwards lost the use of her lower limbs. This was followed by an angular projection of the spinous process of one of the inferior dorsal vertebræ, and a large abscess, which presented itself on one side of the abdomen; and the patient ultimately died. In another case, after the curvature had taken place, the form of it appeared to vary, in consequence of the diseased vertebræ admitting of being moved to a certain extent on each other; these motions being attended with increased pain, both in the spine and in the lower extremities. The last mentioned patient ultimately recovered.

Curvature of the spine in the direction forwards may arise from other causes, as a weak condition of the muscles, or a rickety affection of the bones. In general, in such cases, the curvature occupies the whole spine, which assumes the form of the segment of a circle. At other times, however, it occupies only a portion of the spine, usually that which is formed by the superior lumbar and inferior dorsal vertebræ; as I have ascertained, not only by examinations during life, but by dissection after death. Here the curvature is always gradual; never angular; and thus it may be distinguished from the curvature arising from the caries. Nevertheless, I am satisfied that these different kinds of curvature, arising from different causes, have frequently been confounded with each other; and that some of the cases which have been published as examples of caries of the spine, and in which it may, at first, be a matter of surprise that so complete and so speedy a cure has been effected, have in reality been cases of an entirely different malady.\*

I have already mentioned, that there is reason to believe that suppuration takes place at an earlier period in those cases in which the disease has its origin in the cancellous structure of the bones, than where it begins in the intervertebral cartilages. It is remarkable, in some cases of this last description, to how great an extent ulceration will sometimes proceed, without the formation of abscess. I have known as many as three bodies of vertebræ completely destroyed, and the disease to have lasted many years, without matter having been formed; a fortunate circumstance for the patient, as the chance of his recovery is much greater under these, than it would have been under the opposite circumstances. We must not, however, conclude, because no abscess has shown itself, that therefore no abscess exists. Frequently, in examinations after death, we find an abscess in connection with carious vertebræ, which had never presented itself externally, but which evidently had existed for a considerable length of time.

It is not uncommon to find caries of the vertebræ going on for two or three years before there are any certain indications of the existence of abscess. In one case, in which the disease was in the vertebræ of the loins, an abscess presented itself in the groin at the end of eight years; and in another case, in which the disease was situated in the dorsal vertebræ, the interval was still longer—not less than sixteen years. The formation of abscess is usually attended with some derangement of the general health, such as loss of flesh and muscular power; increased frequency of the pulse; a slight access of fever in the evening, followed by perspirations at night; occasionally, but rarely, rigors.

\* Some excellent observations on this subject have been published by Mr. Earle, in the *Edinburg Medical Journal* for January, 1815



These symptoms may be in some degree relieved by the first bursting of the abscess; but when the daily discharge of matter has continued for some time, they recur in an aggravated form: the patient wastes under the influence of a hectic fever, and some kind of visceral disease supervenes, which proves the immediate cause of death.

The foregoing observations relate to cases of caries of the spine generally; but, to complete the history of the disease, it is necessary to consider the peculiar symptoms which it produces, accordingly as one or another part of the column of the vertebræ is affected by it.

When there is caries of the cervical vertebræ, the patient complains, in the first instance, of pain in the neck, which is aggravated by every motion of the head, and which is not unfrequently mistaken for the muscular pains and stiffness connected with what is commonly called a stiff neck from cold. The pain gradually increases, and, according to my experience, is more liable to be severe than when the seat of the disease is in the lower part of the spine. When, in the progress of the disease, the spine has become incurvated forward, the angular projection posteriorly is observed to be trifling, except when the lowest or seventh cervical vertebra is implicated in the disease; a difference which is easily explained by the greater length of the spinous process of the latter, as compared with that of the spinous processes of the vertebræ above.

Abscess connected with diseased cervical vertebræ usually presents itself among the muscles on the side of the neck. Occasionally it makes its way forward, forming a tumor, and afterwards breaking, in the pharynx. I have seen one case in which the abscess penetrated into the theca vertebralis, and the whole of the spinal chord, from its origin to its termination, was bathed in pus. At an early period of the disease, the patient frequently complains of pains in the arms and shoulders. After some time these pains subside, but they are followed by complete paralysis of the upper extremities; while the muscles which derive their nervous influence from the spinal chord below the neck remain subject to the will. In a still more advanced stage of the disease, the paralysis extends to the muscles of the trunk and of the lower extremities. Then there are pains in the abdomen, which becomes distended and tympanitic; the bowels being at the same time obstinately costive. In all cases, there is pain in the occiput and temples; which is, however, most severe when the disease is situated in the two or three superior vertebræ. Not unfrequently the transverse ligament of the second vertebra is destroyed, and the consequence is, a dislocation of the odontoid process. Sometimes the dislocation is complete, and the patient, from the pressure made on the spinal chord, expires as suddenly as if the latter had been divided transversely. More frequently it happens that the displacement of the odontoid process is somewhat restrained by the pressure of the dura mater which lies over it. There is then some degree of pressure on the spinal chord, sufficient to excite irritation, but not sufficient to destroy its functions. Under these circumstances, the patient complains of increased pain in the head, followed by convulsions, stupor, dilated pupils, and other symptoms of effusion of fluid on the brain; and on examining the body, after death, we find that such effusion has actually taken place, there being a collection of fluid in the ventricles, or in the base of the cranium, or in both of these situations.

In cases of caries of the superior dorsal vertebræ, independently of the usual pain and tenderness of the affected parts, the patient complains of pain and a sense of constriction of the chest; and when the disease is in the inferior dorsal vertebræ there is a similar sensation in the epigastrium, pain in

the abdomen generally, and a disturbed state of the functions of the alimentary canal. Occasionally the urine is alkaline, or it contains albumen, being voided without its natural transparency, and becoming completely opaque on exposure to heat, or on the addition of nitric acid. From this last circumstance, and from their being at the same time pain either in or near the region of the kidney, it is sometimes difficult, in the first instance, to determine whether the patient labors under caries of the spine or disease of the kidney.

When the spine is incurvated forward, in consequence of the destruction of the bodies of the dorsal vertebræ, the angular projection behind is more distinct than it ever is where the disease has attacked the vertebræ of the neck or loins. This is to be attributed to the greater length of the spinous processes in this part of the spine, and to the circumstance of their being, in the ordinary position of the parts, inclined more or less downward. When the curvature is considerable the thorax becomes at the same time altered in figure. The diameter of the thorax, from above downwards, is rendered shorter, while the other diameters are increased; so that, while the figure of the chest is altered, there is but little difference in its actual capacity. If, under these circumstances, an opportunity should occur of examining the appearances after death, we find a change in the position of the viscera corresponding to the altered form of the cavity in which they are contained. This is most apparent in the descending aorta, which is seen taking a spiral, instead of its usual straight course on the fore part of the spine. When the superior dorsal and inferior cervical vertebræ are both implicated in the disease, a large protuberance presents itself between the superior angles of the scapulæ, and the neck appears shortened, as if it had descended or sunk between the shoulders.

As the disease advances, the patient, in some instances, complains of pains, which are referred to one groin and hip, such as may lead to the suspicion that there is disease in the hip-joint; and, in fact, a very common error (and one into which even surgeons of great experience are liable to fall), to regard the symptoms of caries of the middle and inferior dorsal vertebræ as indicating incipient caries of the hip. Afterwards pains, and a sense of constriction, are felt in the legs and thighs. Then the muscles are found to be not properly under the dominion of the will, so that the patient occasionally loses a step, or trips in walking. This is probably followed by a complete loss of voluntary power. In some cases there is an entire paralysis; the muscles of the lower extremities never acting under any circumstances: while in other cases, although they do not act under the influence of volition, they are subject to involuntary contractions or spasms.

Occasionally the loss of voluntary power over the muscles is attended with a total loss of sensibility; but more frequently while the former function of the nerves is destroyed, the latter remains either little or not at all impaired.

Paralysis of the bladder, and incontinence of the urine and fæces, sometimes occur in combination with paralysis of the lower limbs, forming a most distressing addition to the patient's other calamities.

A considerable time generally elapses before abscess connected with caries of the dorsal vertebræ presents itself externally. Sometimes it shows itself on the posterior or lateral, or even on the anterior part of the chest, having penetrated through one of the intervertebral spaces. More commonly it makes its way downwards through the posterior mediastinum, and behind the small muscle of the diaphragm; and then, taking the course of the psoas



muscle, passes behind the crural arch, and shows itself in the anterior and upper part of the thigh. It is not uncommon for the abscess to form a large tumor on one side of the abdomen, occupying the whole, or a great part, of the space between the false ribs and the groin, pushing the viscera to the opposite side, and, at last, making its way to the surface through the abdominal muscles. But a great length of time may elapse before it reaches this termination. I have known such an abscess to remain, neither increasing nor diminishing in size, nor being materially changed in its situation, for several successive years: in some instances being a soft and compressible tumor, in which the fluctuation of matter was distinctly perceptible; in others, appearing like an irregular mass of solid substance, closely attached to the posterior and lateral parts of the spine.

When the lumbar vertebræ are affected with caries, the patient usually complains of pain in the region of the loins; which is aggravated by stooping, turning the body suddenly round, or by percussion. Sometimes the pain is confined to the vertebræ themselves; while at other times it extends forwards, in the direction of the lumbar nerves, to the sides of the abdomen and the crista of the ilium.

When abscess is formed, it usually either descends in the direction of the *psaos* muscle, and presents itself behind the crural arch in the upper and anterior part of the thigh, or otherwise makes its way backwards on the outer edge of the *quadratus lumborum* and *sacro lumbalis* muscles, showing itself on one side of the loins. In some rare cases, it takes the course of the spermatic chord, and forms a tumor projecting through the abdominal ring, such as a superficial observer might easily mistake for a hernia; or, it descends into the pelvis, and afterwards into the posterior part of the thigh, following the direction of the sciatic nerve, through the sacro-sciatic notch of the pelvis. Occasionally it reaches this last mentioned situation in another way. I have known an abscess to have descended from the loins, and presented itself as a tumor in the groin. Suddenly the tumor has disappeared, and the patient has been led to entertain hopes of a speedy recovery. But these have been soon disappointed, in consequence of the discovery of a large collection of matter in the posterior part of the limb, behind the little trochanter of the thigh. In a case of this kind, in which I had the opportunity of examining the morbid appearances after death, I found that the abscess had taken the course of the common tendon of the *psaos magnus* and *iliacus internus* muscles, to their insertion into the little trochanter, afterwards extending further backward, over the inferior edge of the *quadratus femoris*.

I may take this opportunity of observing, that it is by no means uncommon, whatever part of the spine may be the seat of caries, to find an abscess thus altering its course, disappearing in one place, and sometimes afterwards showing itself in another; and this seems to afford a reasonable explanation of some of those cases, in which it has been supposed that an abscess has been suddenly removed by absorption.

It very rarely happens that this disease, when confined to the loins, proceeds so far as to occasion any perceptible alteration in the figure of the spine; and this peculiarity is easily explained, by the greater magnitude of the bodies of the lumbar, as compared with those of the cervical or dorsal vertebræ, in consequence of which, the former are not destroyed by the same degree of caries which would be sufficient for the destruction of the latter.

The same circumstance will also, in great measure, account for another peculiarity of this disease, when it affects the lower portion of the spine; namely, the absence, in the majority of cases, of pains, muscular spasms, pa-

ralysis, and loss of sensibility in the lower limbs. In fact, in these cases it seldom happens that the caries extends so far as to reach the *theca vertebralis*. In one case, in which the patient had complained of numbness of the legs and thighs, I found, on dissection, that the *theca vertebralis* was in no part exposed; but that there was a large abscess on each side surrounding the origin of the anterior crural and obturator nerves, and thus explaining the diminished sensibility of the parts to which they were distributed.

In systematic works on surgery, the lumbar or psoas abscess is usually described as if it were (in some instances at least) a specific or primary disease, having its origin in the psoas muscle. But, according to all the experience which I have had in these cases, this is altogether a mistaken view of the subject. I cannot say that such an abscess never takes place in the loins; but I certainly believe that it is of very rare occurrence. In examining cases of lumbar abscess after death, I have always found caries of the vertebræ, in which the abscess has manifestly originated. In general the disease of the vertebræ has been so obvious, that it could not have been overlooked by the most superficial observer; but, in some instances, the real nature of the disease has not been detected until after a careful dissection. In one instance, on examining the body of a patient who died in St. George's Hospital with an extensive suppuration in the loins, the soft parts having been entirely removed, not the smallest appearance of disease presented itself in the lumbar vertebræ, and I conceived that I had at last met with a case of genuine psoas abscess; when, almost accidentally, a small opening was discovered on one side of the spine, in a part which had been covered by one of the attachments of the psoas muscle, just large enough to admit a common probe, and forming a communication between the cavity of the abscess, and one of the intervertebral spaces. On a further dissection, it was ascertained that the intervertebral cartilage had been completely destroyed by ulceration, except at its circumference, and that the opposite surfaces of the bodies of the two contiguous vertebræ were extensively carious.

### SECTION III.

#### *On the Treatment of Caries of the Spine.*

There are few cases of caries of the spine in which it is not advisable to have recourse to some kind of medical treatment, for the purpose either of correcting that state of the system on which the local disease depends, or of counteracting the ill effects which the latter has produced on the patient's general health. On this subject, however, it will be sufficient for me to refer to the observations which I have already offered in speaking of the treatment of the diseases of the other articulations, in the concluding part of each of the two preceding chapters.

Of those remedies which may be supposed to exercise a more direct influence over the disease, the two which have been principally recommended are; first, a state of absolute rest in the horizontal position, continued during a considerable period of time; and secondly, the establishment of issues made with caustic, or the actual cautery, in the neighborhood of the affected vertebræ.

I suppose that no one will be bold enough to deny the prudence, and that few will deny the absolute necessity, of the first of these remedies. While



the patient is in the erect posture, and the weight of the head and other superincumbent parts are pressing on the ulcerated surfaces, and while these are liable, in the various motions of the body, to a constant (however trifling) friction, it is not probable that the progress of ulceration can be checked, or that suppuration can be prevented. From the first moment in which the nature of the case is clearly indicated, the patient should abandon his usual habits, and be confined altogether to his bed or couch. In some instances, in which severe pain in the vertebræ is among the early symptoms of the disease, the patient will submit to the privations which are thus imposed upon him with sufficient willingness; while in others, nothing but a candid exposition of the ill consequences which may otherwise arise, will overcome his reluctance to do so. The invalid bedstead, contrived by Mr. Earle, and which I have formerly mentioned, will, in ordinary cases, afford the most convenient means of conducting this part of the treatment. The use of it is attended with this great advantage, that the patient may be laid on his back, and the trunk and thighs may be, from time to time, and within moderate limits, elevated or depressed, so that their relative position may be varied without the smallest movement being communicated to the carious vertebræ. Where, however, the disease has been going on for a long time, and there exists already a considerable angular curvature of the spine, it is desirable that the patient should recline on his side rather than on his back; or if he finds this in any way inconvenient or disagreeable, he should lie, not on an absolutely flat surface, but supported by cushions and pillows, so that the position, in which he is placed, may have no tendency to restore the spine to its original figure. In the management of these cases, it is important that we should always bear in mind, that, without undue interference on the part of the surgeon, the carious or ulcerated surface of the vertebra above will come in contact with that of the vertebra below; and that it is to the union which takes place between them under these circumstances, at first by soft substance, and afterwards by bony anchylosis, that we are to look for the patient's recovery. In artificially straightening or elongating the incurvated spine, we necessarily disturb this curative process, and therefore all attempts to do so, whether by means of machinery, or by laying the patient in the supine posture on a horizontal board, are to be scrupulously avoided.

The recumbent position does not constitute the only means which we have it in our power to employ for the purpose of maintaining the diseased spine in a state of perfect repose. When the disease is situated in the dorsal or lumbar vertebræ, the patient may be provided with a bandage, including some strips of whalebone, and somewhat resembling the stays worn by females, but extending as low as the symphysis of the pubes, the os sacrum, and the great trochanter, and as high as the neck. This will operate like splints, fixing the pelvis and thorax in the same relative position. A less efficient support may be given to the cervical vertebræ, by means of a cushion adapted to the shade of the lateral and posterior parts of the neck, and extending from the upper part of the back to the occiput.

Concerning the advantage to be derived from the establishment of issues, there may probably be a greater diversity of opinion than concerning that which is to be obtained from rest and the recumbent posture; and I am well aware that some experienced practitioners of the present day estimate their value at a low rate. It is not, however, easy to suppose that Mr. Pott and others, whose opinion carries with it much authority, should have been mistaken so far as to persevere, during a series of years, in the employment of a remedy which was actually inefficacious. If issues are of service, where the

cartilages of the hip or knee are ulcerated, analogy would lead us to expect, that they may be useful also, where a corresponding disease has taken place in the joints of the vertebræ; and my own experience has certainly tended to confirm this expectation. I have known instances of patients, who have been under precisely the same circumstances with respect to rest, and whose symptoms have been manifestly and considerably relieved, either immediately or in a short time, after the issues had been made; and, where the caustic has been occasionally applied to the surface of the issue for the purpose of keeping it open, other patients have informed me, that "they have uniformly found themselves better in a few hours after each application." At the same time, it must be acknowledged, that some cases occur, in which the caustic issues seem to be productive of little or no benefit. Probably it is with diseases of the vertebral as it is with those of the other joints, and issues may be of little or no efficacy where the ulceration of the cartilages is preceded by a scrofulous disease of the cancellous structure of the bones; and they may be productive of great benefit where it takes place under other circumstances. Nor, if my observations on the subject be well founded, is this to be regarded as a merely theoretical opinion. I have repeatedly known the greatest relief to follow the establishment of issues, where the patient has suffered severe pain in the situation of the carious vertebræ, presenting at the same time no distinct indications of a scrofulous diathesis; while, in young persons, with fair complexions, and dilated pupils, in whom the disease has proceeded with little or no pain, they have appeared to be either inefficacious, or actually injurious. It appears to me also, that in caries of the spine, as well as in that of other joints, issues are to be employed only in the early stage of the disease, with a view to prevent suppuration, and that they are of no service after abscess has actually formed.

An important question remains: how long is the use of these remedies to be continued? It is often difficult to answer such an inquiry even in an individual case; and it is much more so to lay down a general rule on the subject. The issues may be healed on the first clear evidence of the formation of abscess; otherwise, if they occasion little or no inconvenience, they may be kept open for one or two years. With respect to the recumbent position, if there be a reason for having recourse to it, there is also a sufficient reason for it not being abandoned, in less than six or seven months, even when the disease is in its earliest stage; and, in the great majority of cases, the period should be extended to a year, and sometimes to a year and a half.

In the first instance, the surgeon usually finds it difficult to persuade the patient to continue this part of the treatment for a sufficient length of time after the removal of the more urgent symptoms. Afterwards, however, he has to encounter a difficulty of an opposite kind. This happens especially among young females; who often become at last so habituated to their couch, and the peculiar mode of life connected with it, that they can scarcely be persuaded to make the necessary effort to sit up and move about, even after every reason for not doing so has vanished. I know an instance of a lady, who, under these circumstances, has preserved the horizontal position for twelve years; and in whom nearly all the joints of the lower extremities, in which no actual disease ever existed, have, from mere want of exercise, become firmly ankylosed; so that it seems more than probable that nothing which can now be done will enable her to regain the use of the limbs, or even to sit up.

With respect to the treatment of abscesses connected with caries of the spine, I am not aware of any circumstances in which it should differ from



that of abscesses connected with other joints affected by the same disease. The patient should not venture to take exercise, nor even to quit the recumbent posture until the abscesses are healed. This is to be regarded as the general rule ; from which, however, on a very few occasions, it may be right to deviate. I was consulted by a gentleman who was at that time thirty-five years of age, and who had labored under well-marked symptoms of caries of the spine, since he was three years old. There was considerable curvature in the direction forward, with an angular projection of the spinous processes of the middle dorsal vertebræ posteriorly ; and there were two sinuses discharging pus communicating with the carious vertebræ which had existed for nearly thirty years. Nevertheless, the patient had been able to take violent exercise in hunting, and shooting, and other ways, and his general health had been excellent. In fact, he had suffered no material inconvenience from his complaint, except that he once lost the use of his lower limbs ; recovering it, however, completely at the expiration of three months, and after the application of blisters to the back.

## CHAPTER VII.

## ON TUMORS AND LOOSE CARTILAGES IN THE CAVITIES OF JOINTS.

THE loose cartilaginous substances, which are sometimes found in the joints have been so frequently described by writers, that I can have but few observations to offer respecting them. I believe it is generally supposed that these loose bodies have their origin in coagulated lymph, which has been effused from inflammation of the inner surface of the synovial membrane, and which has afterwards become vascular. In the majority of cases, however, which I have met with, no symptoms of inflammation preceded their formation; and hence it is probable that, in some instances, they are generated, like other tumors, in consequence of some morbid action of a different nature.

They appear to be situated originally, either on the external surface, or in the substance of the synovial membrane; since, before they have become detached, a thin layer of the latter may be traced to be reflected over them.

My own experience is much in favor of the removal of these loose cartilages by an incision of the joint, provided that this be done in a cautious and prudent manner. The patient should be kept in a state of the most perfect quietude for two or three days preceding, and for several days after the operation. The cartilage having been well fixed, the different parts over it should be slowly and separately divided until it is exposed. The wound of the synovial membrane may be dilated by means of a probe-pointed bistoury, until it is of sufficient size to allow of the cartilage being extracted with a tenaculum; and the cut edges of the skin should be instantly replaced in contact with each other, and secured by means of adhesive plaster.

I attended a gentleman who labored under this troublesome disease, and in whom the loose bodies not unfrequently slipped between the articulating surfaces of the knee, occasioning an almost immediate swelling of the joint, with the most excruciating pain and tenderness, and much symptomatic fever. In one instance more than a month elapsed before these symptoms had subsided. These circumstances are noticed, because they prove that, in this patient, there was a considerable disposition to inflammation, yet by attending to the precautions above mentioned, as many as five loose cartilages were extracted by three different operations, without the slightest inconvenience from any one of them.

I have seen two cases, in which the loose bodies were of a different nature, and had a different origin from those which are commonly met with. It occasionally happens, that a bony ridge is formed, like small exostosis, round the margin of the cartilages of the joint. In the two cases to which I allude, this preternatural growth of bone had taken place, and in consequence of the motion of the parts on each other, portions of it had been broken off, and lay loose in the cavity of the joint.

In the museum of St. George's hospital there is a specimen of a knee-joint, the inner surface of which is lined by a great number of small pendulous



excrescences, connected with the synovial membrane ; having a smooth external surface, and bearing an apparent resemblance to the *appendices epiploicæ* of the great intestine, though not like them containing adipose substance. The preparation was purchased at the sale of the late Mr. Heaviside's anatomical collection ; and nothing is known of the history of the patient from whom it was taken. We have another somewhat similar specimen ; and, in the last case, there is reason to believe that the excrescences were the result of long-continued inflammation of the synovial membrane. A third example of the same disease is in Sir Charles Bell's museum, which was formerly in Great Windmill Street. The late Mr. Shaw informed me that, in this case, the joint contained a considerable quantity of whey-like fluid ; but he was not able to give me any further information respecting it.

Occasionally, tumors of a different kind are formed on the inner surface of the synovial membrane, and attain a considerable magnitude.

CASE LXVIII.—Morris Sudbury, twenty-one years of age, was admitted into St. George's Hospital, on the 4th of October, 1820.

He had swelling, and complained of pain and tenderness, in one knee. He was kept in bed : the joint was bathed with a cold lotion. Afterwards blisters were applied. The swelling subsided, but the joint continued weak and painful.

On the 11th of December, for the first time, a tumor was discovered evidently within the cavity of the knee-joint, situated on the edge of the patella, over the external condyle of the femur. The tumor appeared like a loose cartilage, of about the size and form of an almond. When the man attempted to walk, in certain motions of the limb, it slipped into the cavity of the joint, producing considerable distress, and making him lame. An attempt was made to confine it by means of bandages, but without success.

On the 5th of January, 1821, Mr. Ewbank made an incision through the skin, fascia, and synovial membrane, so as to expose the tumor. It was found to be not cartilaginous, but of a gristly structure. It was of about the length of an almond, but rather broader ; and it was attached by one extremity to the synovial membrane, near the edge of the patella. This attachment was cut through, and the tumor was removed. The edges of the wound were brought into contact, and united by the first intention. Some inflammation of the joint followed, but was subdued without much difficulty. When the patient began to walk, he found himself to have been much relieved by the operation.

Six weeks afterwards, however, a tumor was discovered in the knee of a smaller size than that which had been removed, but occupying precisely the same situation ; so that there was sufficient reason to believe that it had grown from the same basis. This tumor could be pressed into the joint by the fingers, but did not slip into it spontaneously in walking ; and therefore at the time the man left the hospital, he did not suffer any inconvenience from it.

CASE LXIX.—Mr. H., a young man, consulted me on the 25th of April, 1822, laboring under the following symptoms :—In certain motions of the right knee a tumor presented itself on the inside of the patella, which had been supposed to be, and had the appearance of being, a loose cartilage of a large size. He said that, occasionally, in walking, this substance slipped between the articulating surfaces. The accident always produced considerable pain at the time, and an inflammation of the synovial membrane afterwards, which in one instance confined him to his bed for several weeks. He

said, further, that these symptoms had been gradually coming on for two or three years ; that he had worn bandages, without experiencing any good effect ; and that, as the disease interfered very much with his comfort and occupations, he was desirous of submitting to any operation which afforded him a prospect of relief.

On the 28th of April, after he had remained for one or two days in a state of perfect quietude, I carefully made an incision on the tumor, which had been previously fixed by the finger of an assistant over the inner condyle of the femur. When it was thus exposed, I found the tumor to be, not a loose cartilage, but of a fleshy structure ; and that it was connected to the synovial membrane, below the patella, by a broad adhesion. Having divided this adhesion, I removed the tumor. The edges of the wound were brought together by means of a suture, which was passed through the integuments, and strips of adhesive plaster. The patient was kept in bed, and the limb was supported by a splint, to which it was secured by bandages in such a way as to render the joint quite incapable of motion.

About twenty-two hours after the operation, symptoms of a violent inflammation began to show themselves. There was almost insupportable pain ; the joint became rapidly swollen ; the pulse rose to 90 in a minute, and was hard and strong. By means of very active antiphlogistic treatment, however, the inflammation subsided, without producing any bad consequences. On the 27th of June he was able to undertake a journey to a considerable distance from London ; at which time the knee was neither swollen nor painful, but it was still incapable of perfect flexion and extension.

On examining more accurately the tumor which had been removed in this case, it was found to be about two inches and a half in length, and one inch and a half in breadth, and somewhat less than half an inch in thickness in the thickest part ; convex on one surface, and somewhat flattened on the other. It was of a firm, fleshy structure. The general appearance of it a good deal resembled that of the coagulum which is found in the sac of aneurism ; but it was not laminated : it had a smooth membranous surface ; and it was manifestly organised, as vessels might be distinctly traced ramifying through its substance.\*

In both of these cases the operation was resorted to under the impression that the substance contained in the cavity of the joint was one of the loose cartilages, of which I have spoken in the beginning of this chapter. If I had been acquainted with the real nature of the tumor in the last case, I should certainly have been less inclined to attempt its extirpation ; and the violence of the inflammation which ensued must form an additional reason for hesitation in any future case of the same kind.

But the question will arise, how are such firm fleshy tumors, which are capable of altering their position in the cavity of a joint, and which produce symptoms similar to those which are produced by loose cartilages, to be distinguished from the latter ? Perhaps, being aware of the possibility of the existence of a tumor of this description, we may, by a very careful examination, be enabled to ascertain, even through the superjacent soft parts, that it

\* A remarkable circumstance occurred in the progress of this case. The wound made in the operation united by the first intention ; but the joint being much distended with synovia, the adhesion gave way ; so that the wound was reopened on the ninth or tenth day, and the synovia escaped in a small but constant stream. The discharge of synovia continued ; but the joint being carefully retained in a state of the most perfect quietude, supported on a splint, no additional inflammation of it was the consequence. At last the flow of synovia ceased ; the wound gradually closed ; and in the course of three or four weeks it was firmly cicatrised.



has not the same degree of hardness with cartilage itself. I am not at present acquainted with any other circumstances on which our diagnosis can be founded. Fortunately, however, it happens, that, while loose cartilages in joints are not uncommon, such fleshy tumors as I have just described are of very rare occurrence.

## CHAPTER VIII.

## ON MALIGNANT DISEASES OF THE JOINTS.

It is well known to surgeons, that the bones are liable to those morbid growths and alterations of structure, which, from the peculiar circumstances which mark their progress, are usually denominated malignant diseases.

In the cases which have fallen under my observation, carcinoma of the bones has never occurred as a primary disease, but has always been preceded by carcinoma of the breast or some other glandular organ. The existence of the disease in the bones has been indicated by pains, sometimes slight, at other times most severe, resembling those of deep seated rheumatism, but not yielding to the use of the remedies by which rheumatic pains are usually influenced. In these cases, the bones themselves become unnaturally brittle, and are so easily broken, that I have more than once known a fracture of the femur to be produced by the patient accidentally turning herself in bed ; and, in one instance, a fracture of the clavicle took place on the patient making some slight effort in raising her arm.

Of the two following cases the first affords an example of carcinomatous disease affecting the head of the femur, and producing symptoms somewhat corresponding to those of disease in the hip-joint ; while the second displays the symptoms which it produces when it attacks the vertebræ, and which are such as might lead a superficial observer to mistake the case for one of caries of the spine.

CASE LXX.—A lady, between sixty and seventy years of age, in the year 1817, underwent the operation for the removal of a scirrhus breast. Some time afterwards a hard tumor showed itself in the cicatrix ; and, about the same period, she began to complain of pain in the left hip and thigh. On the 7th of November, 1820, I saw her in consultation with Mr. Smith, surgeon, of Richmond, by whom she was attended. At this time a large scirrhus tumor occupied the situation of the breast which had been amputated. She complained of pain in the hip, thigh, and knee, which was aggravated by pressure : the pain was very severe, keeping her awake at night, except when she was under the influence of a very large dose of opium. There was a cluster of enlarged glands in the groin, making a hard, and somewhat movable tumor. On the 18th of December following, the patient died ; and the body was examined by Mr. Smith and myself on the following day.

We found that the thigh bone had been broken transversely about two inches below the neck ; and it was evident, from the appearance of the fracture, that it had taken place immediately before or after death ; and, in either case, it must have been the result of some very trifling accident. The whole of the superior extremity of the thigh-bone was softer and more brittle than natural : but this morbid change was less distinct below than above the fracture, and it was most distinct in that part of the head of the bone which was contiguous to the cartilage. On making a section of the head and neck of the bone, the earthy matter was found to be very deficient, and a cartilaginous or gristly substance was seen blended with the bony structure.



In several places there were spots of increased vascularity with deposition of some cheesy matter in the centre. The cartilages were not ulcerated, and there was no effusion of pus, lymph, or serum into the cavity of the joint. The enlarged inguinal glands had the structure of scirrhus; and there was a similar mass of scirrhus lymphatic glands in the pelvis, immediately above the crural arch.

CASE LXXI.—A lady, about thirty-eight years of age, consulted me, in the spring of 1832, on account of a scirrhus disease of one breast. There was not a distinct scirrhus tumor imbedded in the substance of the breast, but a conversion of the gland itself into the scirrhus structure. The skin covering the breast was thickened, and manifestly contaminated by the disease.

From this time I saw her occasionally; the disease in the breast making little or no apparent progress.

During the night of the 10th of February 1833, she suddenly became paralytic in the whole of the lower part of her person. She not only lost the power of using her lower limbs, but that of voiding her urine also; and it became necessary to empty the bladder by means of a catheter.

The loss of muscular power was attended with a loss of sensibility as high as the navel and lowest dorsal vertebræ. When the catheter was introduced into the bladder she was not sensible of its introduction.

In the beginning of March the lower limbs became affected with involuntary convulsive movements, which were unattended by pain, but of which the patient complained that it was disagreeable for her to see them.

When the paralysis first took place the urine was clear, and otherwise in a natural state, afterwards it became ammoniacal, and offensive to the smell, depositing a thick mucus, with traces of phosphate of lime in it.

On the 9th of April, 1833, the patient died.

The body was examined by Mr. Cutler, who found the whole of the gland of the breast to have assumed a scirrhus structure.

Several of the dorsal vertebræ were converted into a substance possessing considerable vascularity, of a gristly consistence; some of them containing no earthy matter whatever, so that they could be cut with a knife. Altogether, the alteration in the condition of the vertebræ seemed to be very similar to that which had taken place in the head of the femur, in the case which was last described, except that, being more complete, it might be supposed to indicate a more advanced stage of the disease.

The whole of the lower portion of the *theca vertebralis* was filled with a serous fluid.

There was a deposit of earthy matter in the upper part of each lung; and about four ounces of serous fluid were contained in the cavity of the right pleura.

The kidneys were of a dark color, and highly vascular.

The mucous membrane of the bladder bore marks of considerable inflammation. The ureters pelves, and infundibula of the kidneys were also inflamed, and in some parts lined with coagulated lymph. They were considerably dilated, and contained a putrid mixture of urine and mucus.

The bones are much more liable to be affected by fungous hæmatodes than they are by carcinoma; and the former frequently occurs in them as a primary disease, that is, not having previously shown itself in any other part of the body. Several cases have fallen under my observation, in which a tumor of this description has had its origin in one of the bones of a joint; and it is evident that such a tumor, in its progress affecting the contiguous parts,

must, by degrees, render the joint useless, and terminate in its complete destruction.

In these cases the patient first complains of a slight degree of pain in the affected part, which is somewhat aggravated by exercise. Some time afterwards the bone is observed to be slightly enlarged. As the tumor increases, it is found to be elastic in some parts, hard in others. For a considerable time it does not interfere with the functions of the joint; which, however afterwards becomes limited in its motions, and, ultimately, completely fixed in one position. I have never known but one case in which the patient did not submit to amputation before the disease had reached its most advanced stage; and here the skin became ulcerated, and a large ill-conditioned sore was the consequence.

Amputation is, indeed, the only remedy which the surgeon has to offer; and it is unnecessary to say, that, in all cases of fungous hæmatodes, even this is of doubtful efficacy. In the first of the two following cases I had, however, the satisfaction of learning that the patient continues well at the present time, and more than four years after the operation.

CASE LXXII.—Mr. O., twenty-five years of age, in January, 1828, first experienced a sensation of weakness in the right knee, with a slight pain, after walking even a short distance. These symptoms continued; and, in the course of two or three months, he observed a small tumor over the external condyle. He remained in this state, the tumor not increasing in size, through the spring, and the greater part of the summer.

In the middle of the following August, he one day went through a great deal of fatigue in grouse shooting; after which the tumor began to increase in size.

On the 1st of September, in walking over a field, his foot slipped into a hollow in the ground. This caused great pain in the knee, and he was under the necessity of riding home. After this accident the tumor progressively increased in size. On the 25th January, 1829, he came to London, and placed himself under the care of Mr. Griffiths, of Pimlico, and myself. At this time, there was a very considerable enlargement of the whole of the upper part of the knee-joint, so that it was four inches in circumference larger than the corresponding part of the opposite limb. The tumor was soft and elastic, occupying the situations of both condyles of the femur, but being more especially prominent in that of the outer condyle. The head of the tibia and the patella did not seem to be implicated in the disease, and the joint retained nearly its natural degree of mobility.

For some time after I was consulted the tumor remained nearly stationary: then it began to increase; and, as no remedy seemed to have any dominion over the disease, a consultation was held with Sir Astley Cooper, in which it was determined that the limb should be removed by amputation. The operation was accordingly performed on the 6th of July, 1829.

On examining the amputated limb, the femur was found to terminate abruptly about five inches above the knee-joint. In place of the condyles, and lower part of the shaft of that bone, there was a large tumor, of an irregular form, of that structure to which the name of fungous hæmatodes is commonly applied. The cartilage which had covered the surface of the condyles of the femur was seen expanded over the lower part of the tumor; being every where thinner than natural, but no where in a state of ulceration. In some parts it had contracted adhesions to the cartilage covering the head of the tibia.



In other parts the tumor was covered by some thin remains of the periosteum, and a layer of thickened cellular membrane.

CASE LXXIII.—William Williamson, fourteen years of age, was admitted into St. George's Hospital on the 21st of September, 1831, on account of a tumor on the inside of the right knee, extending from about two inches below the tubercle of the tibia upward, over the inner condyle of the femur, as high as one fourth of that bone, and backward so as to occupy the ham. The boundaries of the tumor were distinctly defined. It seemed to have had its origin in the head of the tibia, and the tendons of the inner hamstring were seen stretched over its surface at the upper part, and apparently terminating in it below. The circumference of the knee-joint, in the situation of the tumor, was eighteen inches. The skin covering the tumor was tense and shining, with large tortuous veins ramifying in it.

On examining it with the hand, some parts of the tumor were found to be hard, while other parts were soft and elastic.

The joint admitted of some degree of motion, but was kept in the half-bent position. The tibia appeared to be the only bone implicated in the disease.

The patient had, generally, had good health; and seemed to be free from all other disease at the time of his being admitted into the hospital.

He stated that, in April, 1831, he first experienced a slight degree of pain in the head of the tibia, especially in walking. About six weeks afterwards he observed a slight enlargement of the bone, which from that time gradually increased.

September 29. The limb was amputated.

On examining the knee-joint, the tumor was found to be wholly formed by an expansion of the head of the tibia. The upper and inner part of the tumor was composed, partly of cysts containing a bloody fluid, and partly of organised medullary substance. In other parts there was a mass of bony and cartilaginous substance, disposed in fibres, which seemed to proceed from what had been the surface of the original bone, and presented a somewhat radiated appearance. The other bones, the cartilages, and the soft parts composing the joint, were in a natural state.

## CHAPTER IX.

## ON SOME OTHER DISEASES OF THE JOINTS.

In the present chapter, it is proposed to notice some other diseases of the joints, which have not been described in the former pages.

1. In those numerous cases in which acute inflammation attacks the shaft of a cylindrical bone, and the periosteum covering it, the disease is usually limited by the epiphysis; so that, notwithstanding the extensive abscesses and exfoliations which frequently ensue, the neighboring joints are not affected by it.

A few instances, however, occur, in which acute inflammation attacks the epiphysis itself, terminating also in more or less extensive exfoliation. Sometimes we find nearly the whole of the epiphysis deprived of its vitality; at other times only one small portion of it, or several small portions in different places.

In some of these cases, the exact nature of the disease is sufficiently obvious; but in others, where the exfoliations are of a very small size, it is difficult, or impossible, to form an exact diagnosis. This is, however, of the less importance, as, under all circumstances, such a disease must terminate in the complete destruction of the joint; so that there is no remedy but amputation.

2. Chronic inflammation, producing a chronic enlargement of the epiphysis, is a not unfrequent occurrence, and is liable to be mistaken for disease in the joint itself; the more so, as inflammation of the synovial membrane sometimes occurs as a secondary disease. The patient, under these circumstances, may derive benefit from the use of sarsaparilla, mercury, the tincture of iodine, mezereon, or from the application of blisters; in short, from any of those remedies which are found to be useful where nodes are formed in other parts of the bones.

Occasionally chronic inflammation of an epiphysis terminates in the formation of an abscess in the centre of the bone, but contiguous to the joint. An abscess of this kind is attended with an extraordinary degree of suffering, such as not only justifies amputation, but induces the patient cheerfully to submit to the operation. Under certain circumstances, however, he may obtain the desired relief without the loss of the limb. The following cases will serve to illustrate both the history and treatment of these cases, and will be found interesting to the practical surgeon.\*

CASE LXXIV.—Mr. P., about twenty-four years of age, consulted me in October, 1824, under the following circumstances:—

There was a considerable enlargement of the lower extremity of the right tibia, extending to the distance of two or three inches from the ankle-joint. The integuments at this part were tense, and they adhered closely to the surface of the bone.

The patient complained of a constant pain, referred to the enlarged bone

\* These cases formed the subject of a paper which I formerly communicated to the Medico-Chirurgical Society, and which has been published in the 17th volume of their Transactions.



and neighboring parts. The pain was always sufficiently distressing; but he was also liable to more severe paroxysms, in which his sufferings were described as most excruciating. These paroxysms recurred at irregular intervals, confining him to his room for many successive days, and being attended with a considerable degree of constitutional disturbance. Mr. P. described the disease as having existed more than twelve years, and as having rendered his life miserable during the whole of that period. In the course of this time he had been under the care of various surgeons, and various modes of treatment had been resorted to without any permanent advantage. The remedies which I prescribed for him were equally inefficacious. Finding himself without any prospect of being relieved by other means, he made up his mind to lose the limb by amputation; and Mr. Travis having seen him with me in consultation, and having concurred in the opinion that this was the best course which could be pursued, the operation was performed accordingly.\*

On examining the amputated limb, it was found that a quantity of new bone had been deposited on the surface of the lower extremity of the tibia. This deposition of new bone was manifestly the result of inflammation of the periosteum at some former period. It was not less than one third of an inch in thickness; and, when the tibia was divided longitudinally with a saw, the line at which the new and old bone were united with each other was distinctly to be seen.

The whole of the lower extremity of the tibia was harder and more compact than under ordinary circumstances, in consequence, as it appeared, of some deposit of bone in the cancellous structure; and in its centre, about one third of an inch above the ankle, there was a cavity of the size of an ordinary walnut, filled with a dark-colored pus. The bone immediately surrounding this cavity was distinguished from that in the neighborhood by its being of a whiter color, and of a still harder texture, and the inner surface of the cavity presented an appearance of high vascularity. The ankle-joint was free from disease.

It seems highly probable that, if the exact nature of the disease had been understood, and the bone had been perforated with a trephine, so as to allow the pus collected in its interior to escape, a cure would have been effected, without the loss of the limb, and with little or no danger to the patient's life. Such, at least, was the opinion which the circumstances of the case led me to form at the time; and I bore them in my mind, in the expectation that, at some future period, I might have the opportunity of acting on the knowledge which they afforded me for the benefit of another patient.

CASE LXXV.—Mr. B., at that time twenty-three years of age, consulted

\* It is right that I should state briefly the termination of the case; especially as the circumstances attending it were probably connected with a peculiar condition of the nervous system, occasioned by the long continuance of the local disease. Unfortunately I preserved no notes of this part of the case at the time; but I have no doubt that my recollection is accurate as to the following particulars. The patient bore the operation with the utmost fortitude, but immediately afterwards he was observed to become exceedingly irritable, restless, and too much disposed to talk. Unfortunately, in the evening there was hemorrhage from the stump; which ceased, however, on removal of the dressings and coagulum. During the night he had no sleep; and on the following day he was restless and incessantly talking, with a rapid pulse. These symptoms became aggravated. There was no disposition to sleep, and the pulse became so rapid that it could be scarcely counted. Until the third or fourth day the tongue remained clean and moist. After this period it became dry, and somewhat brown, and there was constant delirium. The pupils were widely dilated, and the sensibility of the retina was totally destroyed; the glare of a candle not being perceptible even when held close to the eye. Death took place on the fifth day after the operation. No morbid appearances were observed in the post mortem examination.

me in the beginning of February, 1826. There was considerable enlargement of the right tibia, beginning immediately below the knee, and extending downwards, so as to occupy about one third of the length of the bone.

Mr. B. complained of excessive pain, which disturbed his rest at night, and some parts of the swelling were tender to the touch. The knee itself was not swollen, and its motions were perfect.

He said that the disease had begun more than ten years ago, with a slight enlargement and pain in the upper extremity of the tibia; and that these symptoms had gradually increased up to the time of my being consulted. Various remedies had been employed, from which, however, he had derived little or no advantage.

Having inquired into the circumstances of the case, I was led to regard it as one of chronic periostitis; and I adopted the following method of treatment:—An incision was made longitudinally on the anterior and inner part of the tibia, extending from the knee four inches downwards, and penetrating through the periosteum into the substance of the bone. The periosteum was found considerably thickened, and the new bone, which had been deposited beneath, was soft and vascular. The immediate effect of the operation was to relieve the pain which the patient suffered, so that he slept well on the next and every succeeding night. After this I prescribed for him a strong decoction of sarsaparilla. The wound gradually healed; and it was for some time supposed that a perfect cure had been accomplished. The enlargement of the upper extremity of the tibia, however, never entirely subsided; and in August, 1827, pain was once more experienced in it. At first the pain was trifling, but it gradually increased; and when I was again consulted, in January, 1828, Mr. B. was unable to walk about, and quite unfit for his usual occupations. At this period the pain was constant, but more severe at one time than at another, often preventing sleep during several successive nights. The enlargement of the tibia was as great as when I was first consulted; and the skin covering it was tense, and adhering more closely than is natural to the surface of the bone. Some remedies which I prescribed were productive of no benefit. The patient's sufferings were excruciating, and it was necessary that he should, if possible, obtain immediate relief. The resemblances between the symptoms of this case and those of the case already described, were too obvious to be overlooked. It appeared highly probable that they depended on the same cause; and I therefore proposed that the bone should be perforated with a trephine, in the expectation that an abscess would be discovered in its interior. To this the patient readily assented; and, accordingly, the operation was performed in the beginning of March, 1828.

My attention was directed to a spot about two inches below the knee, to which the pain was especially referred. This part of the tibia was exposed by a crucial incision of the integuments. The periosteum now was not in the same state as at the time of the former operation: it was scarcely thicker than natural, and the bone beneath was hard and compact. A trephine of a middle size was applied, and a circle of bone was removed, extending into the cancellous structure, but no abscess was discovered. I then by means of a chisel, removed several other small portions of bone at the bottom of the cavity made by the trephine. As I was proceeding in this part of the operation, the patient suddenly experienced a sensation, which he afterwards described as being similar to that which is produced by touching the cavity of a carious tooth, but much more severe, and immediately some dark-colored pus was seen to issue slowly from the part to which the chisel had been last applied. This was absorbed by a sponge, so that the quantity of pus which escaped



was not accurately measured ; but it appeared to amount in all to about two drams. From this instant the peculiar pain belonging to the disease entirely ceased, and it has never returned. The patient experienced a good deal of pain—the consequence of the operation—for the first twenty-four hours ; after which there was little or no suffering. The wound was dressed lightly to the bottom with lint : nearly six months elapsed before it was completely cicatrized ; but, in about three months from the day of the operation, Mr. B. was enabled to walk about and attend to his usual occupations. He continued well when I last saw him, on the 7th of January, 1832 ; and the tibia was then reduced in size, so as to be scarcely larger than that of the other leg. No exfoliation of bone had ever taken place.

CASE LXXXVI.—In the beginning of January, 1830, Mr. S., thirty-four years of age, consulted me on account of the following symptoms :—

The lower extremity of the left tibia was considerably enlarged ; the skin covering it was tense, and adhered closely to the parts below. The patient complained of a constant aching pain, which he referred to the enlarged bone. Once in two or three weeks there was an attack of pain more severe than usual, during which his sufferings were excruciating, lasting several hours, and sometimes one or two days, and rendering him altogether incapable of following his usual occupations. The pain was described as shooting and throbbing, worse during the night, and attended with such exquisite tenderness of the parts in the neighborhood of the ankle, that the slightest touch was intolerable.

Mr. S. said, that, to the best of his recollection, the disease had begun eighteen years ago, in the following manner :—On going to bed one evening, he suddenly experienced a most acute pain in the inner ankle. On the following morning he was unable to put his foot to the ground, on account of the agony which every attempt to do so occasioned. Leeches were applied several times, and afterwards blisters ; but the pain increased notwithstanding. After some weeks an abscess presented itself, and broke. This was followed by some mitigation of the symptoms. Soon afterwards another abscess formed, and broke in the neighborhood of the first. The two abscesses remained open for a considerable time, and then healed rapidly. Mr. S. now began to regain the use of his limb, and, by degrees, was able to walk as usual.

During the following summer he had a recurrence of pain in the inner ankle, without any further formation of abscess. For eight or ten years afterwards there were occasional attacks of pain, lasting one or two days at a time ; the intervals between them being of various duration, and, in one instance, not less than nine months. After this the attacks recurred more frequently ; and, during the whole of the last two years, the symptoms were nearly as severe as at the time of my being consulted.

On examining the limb, I was struck with the resemblance which it bore to that of the limb in each of the two preceding cases. There was also a remarkable resemblance in the symptoms as described by the patient, and I could not but suspect that they depended on a similar cause. I requested that Mr. Travers, who had attended one of the former cases with me, should be consulted ; and he agreed with me in the opinion, that probably an abscess existed in the centre of the tibia, and that it would be advisable to perforate the bone with a trephine, with the view of enabling the contents of the abscess to escape.

Accordingly, I performed the operation, with the assistance of Mr. Travers, on the 31st of January. A crucial incision was made through the skin, the angles of which were raised, so as to expose a part of the bone above the in-

ner ankle, to which the pain was especially referred. A small trephine was then applied, and a circular portion of bone was removed, extending into the cancellous structure. Other portions of bone were removed with a narrow chisel. At last, about a dram of pus suddenly escaped, and rose into the opening made by the trephine and chisel. On further examination, a cavity was discovered, from which pus had flowed, capable of admitting the extremity of the finger. The inner surface of this cavity was exquisitely tender, the patient experiencing the most excruciating pain on the gentlest introduction of the probe into it.

He passed a tolerable night, and suffered but little on the following day. He continued to go on favorably until the 5th of February; when a violent inflammation attacked the limb immediately above the inner ankle. In spite of the application of leeches, an abscess formed, which, in the course of six or seven days, presented itself immediately below the part at which the trephine had been applied. An opening was made with a lancet, and a considerable quantity of pus escaped, which had apparently formed between the periosteum and bone; the latter being felt exposed at the bottom of the abscess. During the following month the inflammation excited by the operation continued, and several abscesses presented themselves in the neighborhood of the first. These, however, all healed favorably without any exfoliation of bone taking place. The cavity made by the trephine became filled up by granulations, and the wound gradually cicatrised. From the time of the operation, the peculiar pain, from which the patient had previously suffered, was entirely relieved; and it was not long before he was quite restored to health, and able to walk and pursue his occupations without interruption. When I last saw him, nearly two years from the time of the operation having been performed, he continued well.

3. Absorption of the articular cartilages, to a limited extent, sometimes takes place by a process apparently different from that of ulceration. The bone becomes partially denuded, but it bears no marks of inflammation; there is no erosion of the bony surface itself; and the cartilage, which remains entire, retains its natural adhesion to it. The patient does not complain of pain in the joint, nor does suppuration follow. These changes are observed more frequently in the bodies of elderly persons; and they are sometimes discovered after death, where their existence had not been suspected during the patient's life time. At other times, they produce in the motions of the limb a grating, corresponding to, but less distinct than the grating which is perceptible after a fracture.

4. There is a class of cases, of no unfrequent occurrence, in which the patient suffers considerable distress, in consequence of pain referred to some of the larger articulations, and which often occasion no small degree of anxiety and alarm among the patient's friends, although there never arise any ultimate bad consequences. The cases to which I allude occur chiefly among hysterical females. The disease appears to depend on a morbid condition of the nerves, and may be regarded as a local hysterical affection. At first there is pain referred to the hip or knee, or some other joint, without any evident tumefaction; the pain soon becomes very severe, and, by degrees a puffy swelling takes place, in consequence of some degree of serious effusion into the cells of the cellular texture. The swelling is diffused, and, in most instances, trifling; but it varies in degree: and I have known, where the pain has been referred to the hip, the whole of the limb to be visibly enlarged from the crista of the ilium to the knee. There is always exceeding tenderness; connected with which, however, we may observe this remarka-



ble circumstance, that gently touching or pinching the integuments, in such a way as that the pressure cannot affect the deep-seated parts, will often be productive of much more pain than the handling of the limb in a more rude and careless manner. In one instance, where there was this nervous affection of the knee, immediately below the joint there was an actual loss of the natural sensibility; the numbness occupying the space of about two or three inches in the middle of the leg. Persons who labor under this disease are generally liable to other hysterical complaints; and, in all cases, the symptoms appear to be kept up and aggravated by being made the subject of constant attention and anxiety.

No general rules can be laid down for the treatment of cases of this description. The patient sometimes, when the pain is most severe, derives benefit from the use of the following embrocation, applied tepid:—

R. Spiritus Rosmarini, ℥iss.  
Misturæ Camphoræ, ℥viss. M.  
Fiat Embrocatio.

Or the following liniment:—

R. Linimenti Camphoræ Compositi ℥iv.  
Extracti Belladonnæ, ℥ij.  
Fiat Linimentum.

Sometimes the symptoms have abated under the use of active purgatives; or of valerian combined with bark or ammonia; or of injections of assafoetida. Where the menstruation is irregular, we may suppose it to be of the first importance that we should endeavor to restore this function to its healthy condition; and if it be deficient, steel may be exhibited with advantage; or if it be excessive, the mineral acids, combined with sulphate of magnesia, may be administered instead. In a great number of cases, in which the symptoms, which have been just described, exist in combination with a feeble circulation, cold hands and feet, and almost complete want of appetite, the following combination of medicines will be found to be very useful:—

R. Infusi. Quassia, ℥ss.  
Tincturæ ferri ammoniati, ℥ss.  
Ammonia carbonatis, gr. vj.  
Syrupi aurantii, ℥j.  
Aquæ destillatæ, ℥vij.  
Fiat haustus bis vel ter quotidie sumendus.

But none of these remedies will do for the patient what may be accomplished by other means. Her attention should be as much as possible withdrawn from the subject of her complaints, and directed to other objects. She should be encouraged to take exercise out of doors, especially on horseback; to rise early, so that only a moderate number of hours may be passed in bed; to live in a cheerful society, and if she has abandoned them (which has too frequently happened,) to resume, in all respects, the habits of a healthy person.

In general, it is not difficult to distinguish the cases which I have just described from those of more serious disease. Careless surgeons, however, frequently fail in their diagnosis; and even surgeons of experience do so in

some instances. I do not hesitate to say, that a large proportion of young ladies, who have heretofore been supposed to labor under disease of the hip-joint, and the great majority of those who have been treated as suffering from caries of the spine, have, in reality, been affected with these local hysterical symptoms, and nothing more. Except where there is a question concerning life and death, no error in surgical practice can be more dangerous than this ; as it may lead to a patient being confined to her couch, almost in solitude, for months, or even for years, who ought to be taking exercise, and breathing the fresh air, and partaking of the amusements, and enjoying the society of those of her own age.

5. We have abundant opportunities of observing that the joints of different individuals are endowed with different degrees of mobility. This is often very evident in the articulations of the fingers with the metacarpal bones. We see one person whose fingers admit of being extended so as to be in a line with the bones by which they are supported, but of no further motion in this direction ; and we see another, in whom they are capable of being bent backwards, so that the nails may be brought almost in contact with the back of the hand. I suppose that this difference is to be attributed chiefly to the state of the ligaments, by which the bones are held together ; and a corresponding looseness of the ligaments, but existing to a still greater extent, will explain the singular liability to dislocation which may be observed in some individuals. A gentleman consulted me in the year 1820, who had met with the accident of dislocating the patella four times in the right, and once in the left knee. The right shoulder had been twice completely dislocated, and once there had been a subluxation of the same joint. The joint of the left thumb, with the *os trapezium*, had been dislocated several times. In every instance the dislocation had been reduced with the greatest facility, and generally without surgical assistance. The patient, at the time of my seeing him, was not more than twenty-three or twenty-four years of age, and was in perfect health ; except that he was subject to occasional severe headaches, apparently connected with the state of his digestive organs. No peculiarity could be observed in the form and structure of his joints. His muscles were strong, and he was capable of considerable muscular exertion ; he was accustomed to a good deal of walking exercise, but had not been particularly exposed to the ordinary mechanical causes of dislocation.

CASE LXXVII.—6. A lady, in the year 1808, first observed a swelling in the upper part of one knee, which was unattended by pain, and which increased slowly, but uniformly. In the course of three years it had attained so inconvenient a magnitude, that she was induced to consent to the removal of the limb. Mr. Thomas, under whose care the patient was, performed the operation, and allowed me afterwards to examine the amputated joint.

The tumor occupied the upper part of the knee, beginning at the edge of the cartilaginous surface, and extending about three or four inches up the lower part of the thigh. It was interposed between the muscles and the bone of the thigh, so that the former were seen expanded over it. It was of a greyish-white color ; composed of fibres of a gristly semi-transparent substance, with osseous matter intermixed with it, and about two inches in thickness on each side of the femur. At the upper part it was seen distinctly originating in the periosteum ; at the lower part, the periosteum could not be traced, and the structure of the bone was continued into that of the tumor. The cartilages and ligaments of the joint were free from disease. On the external surface of the synovial membrane unconnected with the diseased struc-



ture above, there were three or four flattened bodies ; each of about the size of a kidney bean, of a white color, and of a texture somewhat softer than that of cartilage. The synovial membrane itself was free from disease.

There can be no doubt that, in this case, the original disease was the osteo-sarcomatous tumor, originating in the periosteum of the femur. The circumstance of the other tumors being found connected with the synovial membrane, although the intermediate parts were, to all appearance, in a healthy state, is remarkable ; but something corresponding to this may be observed in other diseases. For example, when the gland of the breast is affected with scirrhus, it is not unusual to find small tubercles of a similar structure in the skin near it, at various distances from each other, although the intermediate adipose substance, as well as the portions of skin between the tubercles themselves, exhibit no marks of disease.

I met with another case, in which the patient appeared to labor under an enormous tumor of the hip. It was ascertained, by dissection, that the hip itself was free from disease, and that the enlargement was formed by an osteo-sarcomatous growth from the periosteum of the upper extremity of the femur. Two other cases have come under my observation, apparently similar to that just mentioned, but in which I had not the opportunity of examining the parts by dissection.

7. The following remarkable case seems worthy of being recorded, as it is one of those which might, by a superficial observer, be mistaken for caries of spine. It confirms a remark which I have made formerly, namely, that disease affecting the cervical portion of the spinal chord produces paralysis of the upper extremities, in the first instance, and of the lower extremities afterwards.

CASE LXXVIII.—A young man, about twenty-one years of age, in January, 1829, after leading a very irregular life, and especially after having been much exposed to damp and cold, was seized with a violent pain in the neck, followed by considerable swelling. The swelling was situated chiefly on the right side, extending from the head to the shoulder. The patient paid little attention to his complaints ; living as usual with respect to both diet and exercise ; but, in spite of this neglect, in a short time the pain and swelling, in a great degree, but never wholly, subsided.

In the beginning of the following April, the upper extremity of the right side became affected with paralysis. Afterwards the opposite limb became, to a great extent, paralytic also. In this state he remained, no active remedies having been adopted for his relief, until he came under my care in the beginning of June.

At this time he complained of some degree of pain in the back of the head and neck ; and he found it difficult to move the head from one side to the other. An enlargement and induration of the soft parts of the neck was still perceptible in the situation of the original swelling. There was complete paralysis of the muscles of the right arm, forearm, and hand : those of the opposite limb were also paralytic, but some of them were still capable of acting feebly, so that he could take hold of the right hand with the left, and move it from one position to another. The muscles of the lower limbs were feeble, but were capable, nevertheless, of supporting the body in the erect posture.

The bowels were very torpid, and the evacuation of a dark color, a good deal resembling tar in appearance.

The urine was slightly alkaline, but voided without difficulty.

Leeches were applied to the neck, and afterwards a seton was introduced.

Mercury was given so as slightly to affect the gums. No amendment, however, followed the use of these remedies. The lower limbs became paralytic and on the 19th of June the patient died, having been for a short time previously in a state of coma.

On examining the body after death, the ventricles of the brain were found to contain about two ounces of watery fluid. The brain itself was of an unusually soft consistence.

The cervical portion of the spinal chord was also softer than natural.

A quantity of soft solid substance, of a grey color, apparently lymph, which had become organized, was found situated between the dura mater and the bodies of the vertebræ, occupying the whole of the anterior and some of the posterior part of the vertebral canal, and extending from the occiput downwards, as low as the fourth cervical vertebra.

A substance similar to that which was found on the inside of the vertebral canal was also found lying on the fore part of the bodies of the cervical vertebræ, extending over the oblique and transverse processes, and communicating with the internal mass by processes extending through the spaces in which the nerves are situated, and surrounding the nerves themselves. The external mass was much larger than the internal, being not only thicker, but extending lower down in the neck. In some parts it was not less than an inch in thickness: in other parts thinner, and, altogether, it was of a very irregular shape.

8. The effects of gout on the joints are very remarkable. The cartilages are absorbed; the exposed surfaces of bone are partially, or entirely, encrusted with a white earthy matter, which I conclude to be lithate of soda; and sometimes they have the appearance of being formed into grooves, as if they had been worn by their friction on each other. In some cases, repeated and long-continued attacks of gout occasion complete ankylosis.

9. Mr. Mayo has published a history of some cases, in which ulceration of the articular cartilages took place under peculiar circumstances, having the character of being an acute disease instead of a chronic affection, as in other instances. Since Mr. Mayo's paper on this subject was published in the *Medico-Chirurgical Transactions*, some cases apparently of the same kind have fallen under my own observation. They are recorded in a former part of this volume.

10. I may take this opportunity of noticing a circumstance, which is of some importance as connected with the diagnosis of disease in the hip-joint.

It occasionally happens that the two lower extremities are not of precisely the same length; and this may be the result of original formation, the femur and tibia of one side being respectively longer than those of the other side. If the whole of this difference amounts, as it sometimes does, to an inch, or an inch and a half, the individual is observed to limp in walking, and the great trochanter belonging to the longer limb is higher and more prominent than that of the other; and this might lead a superficial observer to mistake the case for one of diseased hip.

In some instances, there is a difference in the length of the two lower limbs, in consequence of disease. A diseased bone for the most part does not keep pace in its growth with the other parts of the body; but I have known the reverse of this to happen, of which the following is a remarkable instance:—

CASE LXXIX.—Master M. was brought to me for my opinion, in June, 1832. I saw him in consultation with Dr. Lefevre, physician to the British embassy at St. Petersburg.



The cicatrices of three or four abscesses were seen in the skin on the anterior and upper part of the thigh, and there was considerable thickening of the deep seated soft parts in the same situation, there being also a manifest adhesion of them to the bone. The appearance of the limb was such as would lead to the belief that there was a portion of diseased or dead bone of the femur, with probably some new bone formed round it; and that this had produced a succession of abscesses of the soft parts, as in ordinary cases of necrosis. The history of the case seemed to justify this opinion as to the nature of the disease.

Three years and a half ago the little boy had been suddenly seized with severe pain, which was referred to the knee, but only for a few hours, at the end of which time it shifted its place to the upper and anterior part of the thigh. The pain continued, and swelling immediately took place. At the end of six months an abscess was opened, which, however, soon healed. Afterwards a second abscess formed, which was followed by others; but all of them had healed without any exfoliation having hitherto taken place.

There was some degree of stiffness of the hip-joint, but no more than might be reasonably attributed to the thickening and swelling of the soft parts in the neighborhood. But the most remarkable circumstance in the case was, that the diseased thigh-bone, when measured from the anterior spinous process of the ilium to the patella, was found to be at least an inch and a quarter longer than that of the sound limb. The measurement was made repeatedly and with the greatest care, so that there could be no mistake respecting it. There was no perceptible difference in the length of the bones of the two legs.

In consequence of one limb being thus longer than the other, when the patient stood erect, with the soles of his feet planted on the ground, the great trochanter on the side of the disease appeared to project unnaturally, and this occasioned a manifest alteration in the form of the nates, somewhat corresponding to what is observed in the less advanced stage of disease of the hip-joint. That this appearance of the nates was to be attributed solely to the difference in the length of the two limbs, was proved by this circumstance, that it was at once removed by placing a book an inch and a quarter in thickness under the foot of the sound limb, so as to raise that side of the pelvis to the same level with the other.

## CHAPTER X.

## ON INFLAMMATION OF THE BURSAE MUCOSÆ.\*

*History and Symptoms of this Disease.*

INFLAMMATION of the bursæ mucosæ is marked by nearly the same characters, and (allowance being made for the difference of the parts with which they are connected) produces nearly the same results as inflammation of the synovial membranes of the joints. In the greater number of instances, it occasions an increased secretion of synovia. In other cases, the bursa is distended by a somewhat turbid serum, with portions of coagulated lymph floating in it. Occasionally it terminates in the formation of abscess. Sometimes the membrane of the bursa becomes thickened, and converted into a gristly substance. I have seen it at least half an inch in thickness, with a small cellular cavity in the centre containing synovia. At other times, although the inflammation has continued for a very long period, the membrane of the bursa retains nearly its original structure.

Inflammation of the bursæ mucosæ may be the consequence of pressure or of other local injury. It may arise from the too great use of mercury, from rheumatism, or from some other constitutional affection; and, in such cases, it is frequently combined with inflammation of the synovial membranes of the joints. Sometimes it has the form of an acute, but more frequently it has that of a chronic inflammation.

The inflamed bursa forms a tumor, more or less distinct, according to its situation; more or less painful, according to the character of the inflammation. If the bursa be superficial, the fluctuation of fluid within it is, in the first instance, very perceptible: and, under these circumstances, if the inflammation be considerable, it extends to the surrounding parts, and occasions a redness of the skin. When the disease has existed for a certain period of time, it generally happens, that the fluid is less distinctly to be felt on account of the membrane having become thickened; and, occasionally, this takes place to such an extent, that the tumor exhibits all the characters of a hard solid substance, of which the fluid contents are imperceptible.

When the inflammation is of long standing, it is not unusual to find floating in the fluid of the bursa a number of loose bodies, of a flattened oval form, of a light-brown color, with smooth surfaces, resembling small melon seeds in appearance. There seems to be no doubt that these loose bodies

\* I include under this head the membranes forming the sheaths of tendons, which have the same structure, answer a similar purpose, and cannot with propriety be distinguished from other bursæ. I adopt the term *bursæ mucosæ*, because it has been in general use, although it ill expresses the functions of the organs to which it is applied.



have their origin in the coagulated lymph which was effused in the early stage of the disease: and I have had opportunities, by the examination of several cases, to trace the steps of their gradual formation. At first the coagulated lymph forms irregular masses of no determined shape, which afterwards, by the motion and pressure of the contiguous parts, are broken down into smaller portions. These, by degrees, become of a regular form, and assume a firmer consistence: and at last they terminate in the flat oval bodies, which have been just described.

When inflammation of a bursa mucosa ends in suppuration, the abscess sometimes makes its way directly to the surface of the skin, and bursts externally: but I suspect that, in other cases, the matter, in the first instance, escapes into the surrounding cellular membrane, and then it is liable to be confounded with those abscesses which originate in this texture. The following circumstances seem to warrant this opinion. There is no bursa more liable to be inflamed than that between the patella and the skin; and inflammation of it not unfrequently terminates in suppuration, as I have ascertained to be the case, both by the discharge of pus, when the tumor has been punctured, and by dissection after death. It is very common to find a large abscess on the anterior part of the knee, which the patient describes as having commenced over the centre of the patella in the situation of this bursa. The abscess has a somewhat peculiar character. It raises the skin from the patella, so that the latter cannot be felt, and from this point, as from a centre, it extends itself between the skin and the fascia, equally in every direction, covering the whole of the anterior part of the knee. A superficial observer, judging from the general form of the tumor, and the fluctuation of fluid, without noticing the greater redness of the skin, and the circumstance of the fluid being over, instead of under the patella, might mistake the case for one of inflammation of the synovial membrane of the joint itself. Such an abscess must be supposed to commence either in the bursa above mentioned, or in the cellular texture. The original situation of the disease corresponds to that of the bursa: there appears to be no reason why an abscess of the cellular texture should occur in this precise spot, more frequently than elsewhere; and hence, it is reasonable to conclude, that the bursa is the part in which the abscess begins. It is not improbable that many other abscesses of the extremities may have a similar origin. The tumor which occurs in the inside of the ball of the great toe, and which is one of those to which the name of bunion has been applied, occasionally suppurates; and I have found, on dissection, that this is formed by an inflammation of the bursa, which is here situated.

It frequently happens, after the inflammation has entirely subsided, that the disposition to secrete a preternatural quantity of fluid still remains, and that a dropsy of the bursa is the consequence; in like manner as hydrocele takes place, in some cases, as a consequence of inflammation of the tunica vaginalis of the testicle. Such tumors are very commonly met with in the neighborhood of the wrist, and are sometimes confounded with ganglions. The enlarged bursa on the anterior part of the wrist has somewhat peculiar characters: it is bound down in the centre by the strong annular ligament, which binds down the flexor tendons; and it is prominent above and below, where the superjacent parts afford a smaller degree of resistance. Pressure made on the upper part of the tumor causes the fluid to pass altogether into the palm of the hand, and, in like manner, pressure on the lower part of it causes it to ascend into the forearm.

## SECTION II.

*On the Treatment.*

In the first instance, leeches and cold lotions, and afterwards blisters, or stimulating liniments, may be employed with advantage; and in particular cases these may be combined with the use of the *Colchicum*, or such constitutional remedies as their peculiar circumstances seem to indicate. Under this treatment the inflammation of the bursa may be relieved without difficulty; and, in the early stage of the disease, the fluid which has been effused will become absorbed.

But where the disease has been long established, the preternatural secretion of fluid will often continue after the inflammation has entirely subsided. Under these circumstances, a blister may be applied, and kept open with the savine cerate, the part being at the same time supported by a splint or bandages, so as to limit its motion, or rather, so as to keep it in a state of absolute immobility. In many cases, the loose bodies, which have been described in the last section, are found in the cavity of the bursa; and these may in themselves be sufficient to keep up the formation of fluid. Under these circumstances, the first step towards a cure is to puncture the bursa, so as to allow these loose bodies to escape.

I have observed, where the puncture of the tumor is followed by suppuration, and the whole cavity of the bursa is thus converted into an abscess, that, after the suppuration has ceased, no further collection of fluid, in general, takes place, so that there is a permanent cure of the disease. Hence I have sometimes been induced after using the lancet, to bring on suppuration by artificial means. This may be effected by introducing a seton or tent into the wound, or by making a free opening into the bursa, and dressing the cavity of it with lint. Even where the bursa forms the sheath of one or more tendons, this method may be employed with safety; provided that the bursa has no communication with the cavity of the neighboring joint.

We must, however, proceed with caution where the bursa is dilated to a considerable size. Inflammation and suppuration of a large bursa sometimes disturbs the constitution in so great a degree, that it may be doubtful whether it would be prudent, in this instance, to do more than simply puncture the tumor, keeping the patient in a state of perfect quietude afterwards. A large swelling, formed by a cyst distended with serum only, or with serum and masses of coagulated lymph floating in it, occasionally is met with over the inferior angle of the scapula; originating either in the large bursa mucosa, which is interposed at this part between the *scapula* and the *latissimus dorsi* muscle, or otherwise in one of the bursæ of the shoulder, protruding from underneath the muscles, by which that joint is surrounded. I had an opportunity of seeing a tumor of this description, which had attained a magnitude not much less than that of a man's head. I understood that the cyst was afterwards punctured, and a seton passed through its cavity, and that so much disturbance of the general system ensued, as to occasion death. I have seen another case, in which death took place in a short time after such a tumor was punctured: but here the patient was otherwise in bad health, and that



strict attention was not paid to his being kept in a state of quietude after the operation, which circumstances seem to have required. I shall give an account of a more fortunate case of the same kind hereafter.

When the coats of the bursa have become much thickened, I am not aware that there is any method, by which they can be restored to their natural condition. If the diseased bursa be situated superficially, it may be removed with as much facility as an encysted tumor. I have never, indeed, performed this operation myself, nor have I heard of it being done by others, except on the bursa, which is situated between the patella and the skin; but there can be no doubt that there are some other superficial bursæ to which the operation would be equally applicable if occasion called for it. On the other hand, where the bursa envelopes tendons, or where it is deep-seated, the operation must be impracticable; and where the bursa communicates with the cavity of a joint, if practicable, it must be improper.

In those cases, where the bursa over the patella has been extirpated, I do not know that the patient has afterwards suffered any inconvenience from the want of it; and, in fact, there is sufficient evidence that a new bursa is ultimately formed in the place of that which had been taken away. A synovial membrane is of simple structure. It may be resolved by maceration into cellular texture; and instances are not wanting of new synovial membranes being formed where none before existed. Such is the case in an artificial joint after an ununited fracture. In a young lady, who had attained the age of ten or twelve years, laboring under the inconvenience of a club foot, a large bursa was distinctly to be felt on that part of the instep which came in contact with the ground in walking; and in another young lady, who had apparently recovered of a caries of the spine, attended with a considerable angular curvature, a bursa appeared to have been formed between the projecting spinous process and the skin.

### SECTION III.

#### *Cases of this Disease.*

CASE LXXX.—Mary Newnham, twenty-two years of age, was admitted into St. George's Hospital, having the bursa over the right patella enlarged to the size of a small orange. It contained fluid, and the membrane of the bursa appeared to be very little thickened. At this time she experienced no pain, and there was no inconvenience, except what arose from the bulk of the tumor.

Blisters having been applied, and other methods having been applied, with a view to promote the absorption of fluid, without success, I made a puncture with a lancet, and more than an ounce of serous fluid escaped. I then introduced the blunt end of a probe and irritated the inner surface of the bursa; in consequence of which, on the following day, there was some degree of pain and swelling, with a slight symptomatic fever. On the fourth day after the operation, on removing the dressings, about half an ounce of pus was discharged. The suppuration continued, but the quantity of pus daily diminished, and, at the end of three weeks, the wound was healed, and the tumor had wholly disappeared.

CASE LXXXI.—Mrs. T., between twenty and thirty years of age, in the middle of March, 1818, first observed a tumor situated over the inferior

angle of one scapula, and attended with a trifling degree of pain and tenderness. In the course of a week, the tumor had attained its greatest magnitude, and then remained stationary. In the following April, when she came under my care, the tumor was of the size of a large cocoa-nut; of an oval shape; distinctly circumscribed; occupying the place of the large bursa mucosa, which is situated between the *latissimus dorsi* muscle and the inferior angle of the scapula.

On the 22d of May, the tumor being nearly in the same condition, I made a puncture with an abscess lancet, and about a pint of turbid serum was evacuated, with some irregularly shaped masses of coagulated lymph floating in it. Adhesive plaster was placed over the wound, and secured by a compress and bandage; and she was desired to remain perfectly quiet in bed. The wound did not heal by the first intention; and, on removing the dressing at the end of four days, a considerable quantity of pus escaped. The discharge of pus continued, but the quantity daily diminished; no untoward symptoms took place, but nearly three months elapsed before the suppuration had entirely ceased, and the wound had healed. At this time there were no remains of the tumor, and she was in all respects well.

CASE LXXXII.—A. B., a middle-aged woman, became a patient of St. George's Hospital, under Mr. R. Keate, on account of a tumor on the back part of the wrist, of the size of a double walnut, containing fluid; and which had been the consequence of inflammation of the bursa mucosa, which envelops the extensor tendons of the fingers. At the time of her coming to the hospital the inflammation had entirely subsided, and the tumor occasioned no inconvenience, except what might be attributed to its bulk. After having employed various local remedies without any reduction of the swelling, a puncture was made, and a considerable quantity of serous fluid was evacuated. In a short time, however, the fluid was again collected in as large a quantity as before. Afterwards Mr. R. Keate made a longitudinal incision in the skin over the tumor, and dissected out as much as possible of the bursa, leaving only that part of it which enveloped the tendons. The wound suppurated, and healed gradually; and, at first, it was supposed that the operation had produced a cure. But in a few weeks after the wound had cicatrised, the tumor reappeared, having the same character as before, but being of not more than one half of its former size: and when I last saw the patient it continued in the same state.

CASE LXXXIII.—Ruth Target was admitted into St. George's Hospital, in August, 1809, on account of a hard and apparently solid tumor, of the size of a small orange, situated between the patella and the skin, and perfectly movable on the parts below.

Having made a longitudinal incision of the integuments, I removed the tumor with perfect facility. A slight degree of symptomatic fever followed the operation, which, however, speedily subsided, and, at the end of a month she was discharged as cured, suffering no inconvenience except a very trifling sense of stiffness when she walked.

On examining the tumor, after its removal, it was found to be formed by the bursa, which is situated over the patella; the parietes of which had become more than half an inch in thickness, and of a ligamentous texture; while the interior retained its natural cellular structure, and was filled with a serous fluid.

I have since performed a similar operation on several patients. In each case, after the wound was healed, there was at first considerable stiffness of the knee, in consequence of the cicatrix having formed a close attachment



to the anterior surface of the patella. Where, however, I had the opportunity of seeing the patient afterwards, I always found that this inconvenience had been of short duration, and that there was every reason to believe that the bursa had been regenerated. The following case is not without interest, proving as it does, beyond the possibility of doubt, that such regeneration actually takes place.

CASE LXXXIV.—Mary Buckly, seventeen years of age, was a patient in St. George's Hospital, in the beginning of the year 1828, on account of a tumor formed by an enlargement of the bursa between the patella and the skin. The tumor was removed entire by the late Mr. Rose.

About the beginning of November, 1828, another tumor presented itself in the situation of that which had been taken away. This tumor gradually increased in size; and, when she was readmitted into the hospital on the 14th of January, 1829, it had all the character of an enlarged bursa, occupying the exact place of that which had existed formerly.

January 21st. I made a free incision into the tumor with a lancet. There was a cavity in its centre, from which lymph and serum escaped: the surface of it thus exposed was dressed with dry lint and a poultice over it. It soon became covered with granulations; and on the 4th of February the patient left the hospital cured.

#### ADDITIONAL NOTES.

##### 1. On Ulceration of the Articular Cartilages.

AMONG the cases which have been recorded in the foregoing pages, there are several in which the cartilages of a joint were found to have been absorbed on the surface towards the articular cavity; while the larger, next the bone, retained its natural adhesion, and was in other respects unaltered. I have always regarded this partial removal of the cartilage as not to be explained, except on the supposition of its having been acted on by its own vessels. And, in the beginning of the fourth chapter, I have given my reasons for believing that this circumstance is by no means remarkable, or contrary to what might, *a priori*, have been expected.

My friend Mr. Key, in an interesting paper, which he has lately published in the Medico-Chirurgical Transactions, has related the history of a case, in which a similar appearance of the cartilage was connected with an inflamed state of the synovial membrane, processes or elongations of which were seen lying in contact with the articulating surfaces: and from this and some other circumstances, he has been led to infer, that this kind of absorption of the cartilage is to be attributed, not to any changes originating in the cartilage itself, but to the action of the vessels of the synovial membrane; and, further, that when inflammation of the last mentioned structure is followed by ulceration of the cartilage, the ulceration is accomplished in the same manner; the vessels of the cartilage being, in fact, unequal to such a process of destruction.

I have had no opportunity of examining the preparation from which the drawing annexed to Mr. Key's paper has been taken; and I cannot, therefore, venture to contradict the opinion which he has expressed respecting this particular case. If it be correct, it establishes a new fact in pathology; as I am not aware that there is any instance, in other parts of the body, of the ulcer-

ation or absorption of one living texture being affected by the action of the vessels of another, there being no continuity of substance between them.

The perusal of Mr. Key's paper has, however, induced me to renew my inquiries on the subject; and, in doing so, I have found what appears to me to be abundant and satisfactory evidence that the explanation, which he has offered, does not admit of a general application, and that the absorption of the cartilage, commencing on the surface towards the cavity of a joint, may take place under such circumstances, that it cannot be supposed to be the result of any other agency than that of the vessels of the cartilage itself. The following facts are only a part of those which might be adduced, if it were necessary in confirmation of what has been just stated.

1. At page 36 of this volume, I have mentioned the case of a boy in whom this partial absorption of the cartilage of the knee had taken place. In some parts the cartilage had altogether disappeared; in other parts, it had been absorbed on the surface towards the cavity of the joint, while the layer next the bone, remained entire; thus presenting the appearance of grooves, as if a portion of its substance had been removed by a chisel. Now according to Mr. Key's hypothesis, the absorption of the cartilage, in this case, ought to have been produced by villous processes of the synovial membrane projecting into the cavity of the joint, and lying in contact with the articulating surfaces. But no such villous processes existed, nor is any thing said in my manuscript notes of the synovial membrane having been even inflamed. Indeed, if it were inflamed at all, it must have been so only to a very small extent, as it is expressly stated, that there was no effusion, either of pus or synovia, into the cavity of the joint. It is to be presumed that, if the absorption of the cartilage had been effected through the agency of the synovial membrane, it would have begun, and would have made the greatest progress, at the part most exposed to contact with it, namely, at the margin; and this corresponds with Mr. Key's own observations on the subject. But, in examining the condyles of the femur taken from this patient, which are preserved in spirits in the museum of St. George's Hospital, I find that this is exactly contrary to what has really happened. Throughout nearly the whole of its circumference, for the breadth of one third of an inch, the cartilage remains of its natural thickness, and otherwise unaltered; in the centre of the bone it has altogether disappeared, and the grooved appearance of it is observable in the intermediate space.\*

2. In the case of Harper, related at page 40, the cartilage covering the head of the femur had been destroyed by ulceration for more than half its extent, so as to expose the cancellous structure of bone. The remaining portion of the cartilage was thinner than natural; but this was more observable in some parts than in others. With the exception of one spot of limited extent, this partial loss of substance had taken place towards the cavity of the joint, the layer of cartilage next the bone being unaltered. The synovial membrane was somewhat more vascular than usual; but the increased vascularity seemed scarcely to amount to inflammation.

3. I have in my possession a drawing made from a knee, amputated within the last six or seven years in St. George's Hospital, in which the same par-

\* It is worthy of notice, that in this case there was a large abscess of the thigh, external to the knee-joint. A similar abscess existed in one of the cases described by Mr. Mayo in the *Medico-Chirurgical Transactions*, to which I shall have occasion to refer presently. Three other cases have fallen under my observation, in which a large abscess, external to a joint, was accompanied with ulceration of the articular cartilages; no suppuration having taken place in the joint itself.



tial absorption of the cartilage covering the head of the tibia and condyles of the femur had taken place, producing the appearance of grooves on the surface towards the cavity of the joint. In this case there are manifest indications of the same process having begun in the cartilage of the patella, and of that portion of the femur with which the patella was in contact, and to which the villous processes of the synovial membrane (of which there are no indications in the drawing,) even if they had existed, could not easily have penetrated. The condyles of the femur belonging to this case are preserved in the museum of St. George's Hospital; and, on examining them, I find that the absorption of the cartilage had been almost wholly confined to the centre of the bone; while at the margin, where it must have been the most exposed to being acted on by the synovial membrane, scarcely any absorption of it had taken place.

4. In a paper on the ulceration of the cartilages of the joints, published by Mr. Mayo in the 11th volume of the *Medico-Chirurgical Transactions*, a case is described, in which, on exposing the cavity of the joint, in dissection, "the surfaces of the astragalus, tibia, and fibula were found almost wholly stripped of their cartilage: what remained of this texture was thinned, and that unequally, but seemed in other respects unchanged, and adhered firmly to the bone. The same alteration was observed in the other joints, which the astragalus concurs in forming. The exposed surfaces of bone were healthy." In answer to some inquiries which I have lately made, Mr. Mayo has informed me, that "the synovial membrane was red and thickened where it lined the capsular ligament; but there were none of those villous processes projecting into the cavity of the joint which Mr. Key has described as the agents by which the absorption of the cartilages is effected." Indeed, whoever considers the peculiar form and relative position of the articulating surfaces of the ankle-joint, will, I conceive, find it difficult to understand how those processes, even if they had existed, could have extended into the joint, so as to perform the office which Mr. Key has assigned to them. If any further proof be required of the synovial membrane not having been concerned in the absorption of the cartilage, in this particular instance, it is afforded by the preparation of the astragalus which is preserved in the museum of King's College, and which Mr. Mayo has allowed me to examine. In the central part of each articulating surface the cartilage has become absorbed to a great extent, and what remains is reduced to a very thin layer, adhering as firmly as usual to the bone; but at the margin, close to the reflection of the synovial membrane over it, a narrow strip of cartilage is almost every where perceptible; and in many places there are portions of cartilage, of their ordinary thickness, and evidently not altered from their natural condition.

In speaking of ulceration of the articular cartilages as a consequence of inflammation of the synovial membrane, I have not endeavored to explain the exact nature of the process by which such ulceration is effected, and simply for this reason,—that I have not been able completely to satisfy my own mind on the subject. There can be no doubt that, in many instances, ulceration begins at the margin of the cartilage, where the synovial membrane is reflected over it from the neighboring bone, or from the interarticular ligaments, where such ligaments exist; but it may still admit of a question, in what manner the ulceration is accomplished: whether it be from the inflammation extending directly to the cartilage itself, or to the bone first, and the cartilage afterwards;\* or whether, according to the views entertained by Mr.

\* I am led to offer this as one of the explanations which might be given of ulceration of the cartilage, induced by inflammation of the synovial membrane, in consequence of what was

Key, the latter, being altogether in a passive state, becomes absorbed by the action of the vessels of the fringed processes of the synovial membrane lying in contact with it. But there are other cases of inflammation of the synovial membrane, in which ulceration begins in the centre of the cartilage; so that none of these hypotheses afford any reasonable explanation of it.

It seems not improbable, that in some of those cases, which are usually regarded as examples of simple inflammation of the synovial membrane, the inflammation may not have been confined (even in the first instance) to this individual part, but may have begun simultaneously in all the textures of the joint. This is in conformity with what is observed to happen occasionally in the eye, and in other organs; and, under such circumstances, it is no more than might be expected, that, as the inflammation subsides, the cartilage should ulcerate either in the centre, or in some other part of its surface. Nor is this a merely speculative opinion: at least, I am much mistaken if it be viewed in that light by any one who, after having perused the history of the following case, considers what would probably have happened if the patient had not died of another disease, before there was time for the disease in the joint to have run its course.

A gentleman, about twenty-five years of age, had labored for several years under a disease of the brain, in consequence of which he had been in a state of complete helplessness and imbecility. In the summer of 1820, he became indisposed otherwise; there was a cluster of enlarged glands in the left groin, and a purulent sediment was deposited by the urine. I was now desired to see him in consultation with Dr. Maton, who was his ordinary medical attendant. Soon afterwards, it was observed that there was a general tumefaction of the left thigh and nates, and the patient complained of pain in certain motions of the limb. Under the treatment employed, the tumefaction subsided; but immediately afterwards a violent attack of diarrhœa took place; under which he sunk and died on the 29th of July.

On examining the body, we discovered an abscess, which seemed to have had its origin in the cellular membrane of the pelvis, near the neck of the bladder, which had burst into the neighboring portion of the urethra, and which had also extended upwards on the left side, so that it could be traced as high as the mass of enlarged glands in the groin.

The whole of the muscles surrounding the left hip-joint were preternaturally soft and vascular, and so altered from their natural condition, that they could be lacerated by the slightest force. They also were to a considerable extent detached or separated from each other, apparently in consequence of a serous fluid which had been effused between them, but of which nearly the whole had become absorbed. The capsular ligament and synovial membrane of the joint were of a red color, and unusually vascular: and the cartilages covering the head of the femur, and lining the acetabulum, were also red, and of a soft consistence, giving to the fingers a sensation somewhat resembling that which is produced by touching velvet.

In the scrofulous disease of the joints, which is described in the fifth chapter, the first change commonly observed is that the cartilage adheres less firmly than is usual to the bone, so that it may be easily separated from it. This is followed by absorption of the cartilage, beginning on the surface

observed in Case I. p. 4, in which the cartilage presented no appearance of disease, except that, "at the edge of one of the condyles of the femur, it adhered to the bone less firmly than usual." I have observed, in some other cases, but especially in those of the scrofulous disease, which has its origin in the bones, that a similar adhesion of the cartilage to the bone is not unfrequently to be noticed where the former is about to ulcerate.



towards the bone. Occasionally red spots are observed in the cartilage, which might be supposed to indicate an increased vascularity preceding ulceration, and, in two cases (that of Scales, page 69, and King, page 70), vessels injected with red blood could be distinctly traced extending from the bone into the cartilages covering them.

The degeneration of the cartilage into a fibrous structure is no uncommon circumstance; and I suspect that it is *one* cause of the crackling of the joints which is not uncommonly met with in persons somewhat advanced in life. I have no doubt that it often exists where it is never followed by ulceration; but I am also well assured that, in many other instances, it precedes, and in fact, forms, the first stage of this disease; and several cases, confirming this observation, are recorded in former parts of the present volume.

There are other cases, in which what I have described as primary ulceration of the cartilage is preceded, not by this peculiar change of structure, put by a chronic inflammatory affection of the bone to which the cartilage is attached. I do not undertake to explain how these two orders of cases are to be distinguished from each other in the living person: and, in fact, in the present state of pathological science, it is no more possible to do so, than it is to determine whether a node, formed by a thickening of the periosteum, has originated in the periosteum itself, or in the bone which it envelopes. Indeed, it is only during the very early stage of the disease that this distinction can be made, even by the morbid anatomist; as, whatever may have been the state of the bone originally, its cancellous structure becomes affected with chronic inflammation as soon as ulceration originating in the cartilage has extended to it.

Mr. Key has expressed some doubts whether, in the ordinary disease of the hip-joint, the cartilage is the part primarily affected; and seems to regard it rather as the consequence of inflammation of the *ligamentum teres*. On this, as on other subjects connected with these inquiries, I do not undertake to do more than state the results of my own individual experience; and they are as follows:—During a series of years, I sought every opportunity of examining the morbid appearances of the hip-joint, more especially in the early stage of disease, whatever the disease might be; and, in the cases which came under my observation, I certainly found, in children under the age of puberty, that the scrofulous disease described in the fifth chapter predominated, while, in adults, the disease, for the most part, manifestly began either in the cartilage itself, or in the surface of the bone beneath. In making this observation, of course I do not mean to contradict what I have formerly stated with respect to the occurrence of ulceration of the cartilages of the hip as a consequence of inflammation of the synovial membrane. Neither do I mean to assert, that there is no such thing as inflammation of the *ligamentum teres* preceding ulceration of the harder textures: but I am not aware that I have ever met with an instance of the kind; nor is it what I should have much expected to be the case, considering how little liable the other articular ligaments appear to be to inflammatory affections.\*

\* The view which I have taken of the more important diseases which occur in the hip-joint derives confirmation from what we see of those diseases of the joints between the bodies of the vertebræ which terminate in caries of the spine. We cannot overlook the correspondence between the diseases of the spine and those of the hip; nor how they occur under similar circumstances, run nearly the same course, and seem for the most part to depend on the same state of constitution. But the joints between the bodies of the vertebræ have no synovial membranes: and I do not know that there is the smallest evidence in favor of the opinion, that the ligaments of the spine are ever the parts primarily affected. I have formerly stated "that an extensive caries of the spine may have its origin, sometimes in an ulceration of the inter-

Notwithstanding the ingenious arguments advanced by Mr. Key, I must acknowledge that I find no just grounds for the opinion, that the articular cartilages are so little liable, as he supposes to be, to become ulcerated from the action of their own vessels. They may be regarded as bearing nearly the same relation to the synovial membrane which the transparent cornea bears to the *tunica conjunctiva*: yet how rare is it to find ulcers of the last-mentioned texture, and how frequent are ulcers of the cornea! I am not aware that there is any good reason to believe that the capability of ulceration is greater in those textures which possess much vascularity than it is in others. It is true, that tendons do not readily ulcerate; but the same observation may be made with respect to the muscles to which they are attached, although the latter receive a larger supply of blood, and, apparently, have their vital powers more developed than almost any other part of the animal system. The cicatrix of an ulcer, after a certain time, becomes less vascular than the skin by which it is surrounded; yet, it is well known that the former is made to ulcerate from causes which would not produce ulceration in the latter; and this circumstance is, indeed, usually regarded as a proof of the cicatrix being endowed with inferior vital powers to those which belong to parts of original formation. But setting these arguments aside, it may be observed that, although the articular cartilages, in the adult, at least, exhibit no vessels capable of carrying red blood, they must, nevertheless, be well supplied with the means of growth, and, probably, have greater power of reparation than any other textures in the body. None are exposed in the same degree to the influence of pressure and friction: which, however, produce no change in their condition. As long as they are thus exercised, they retain their natural thickness, and all their properties, unimpaired; but when these causes cease to operate, they waste like other organs, which are not kept in constant use, and in the course of time, may almost wholly disappear.

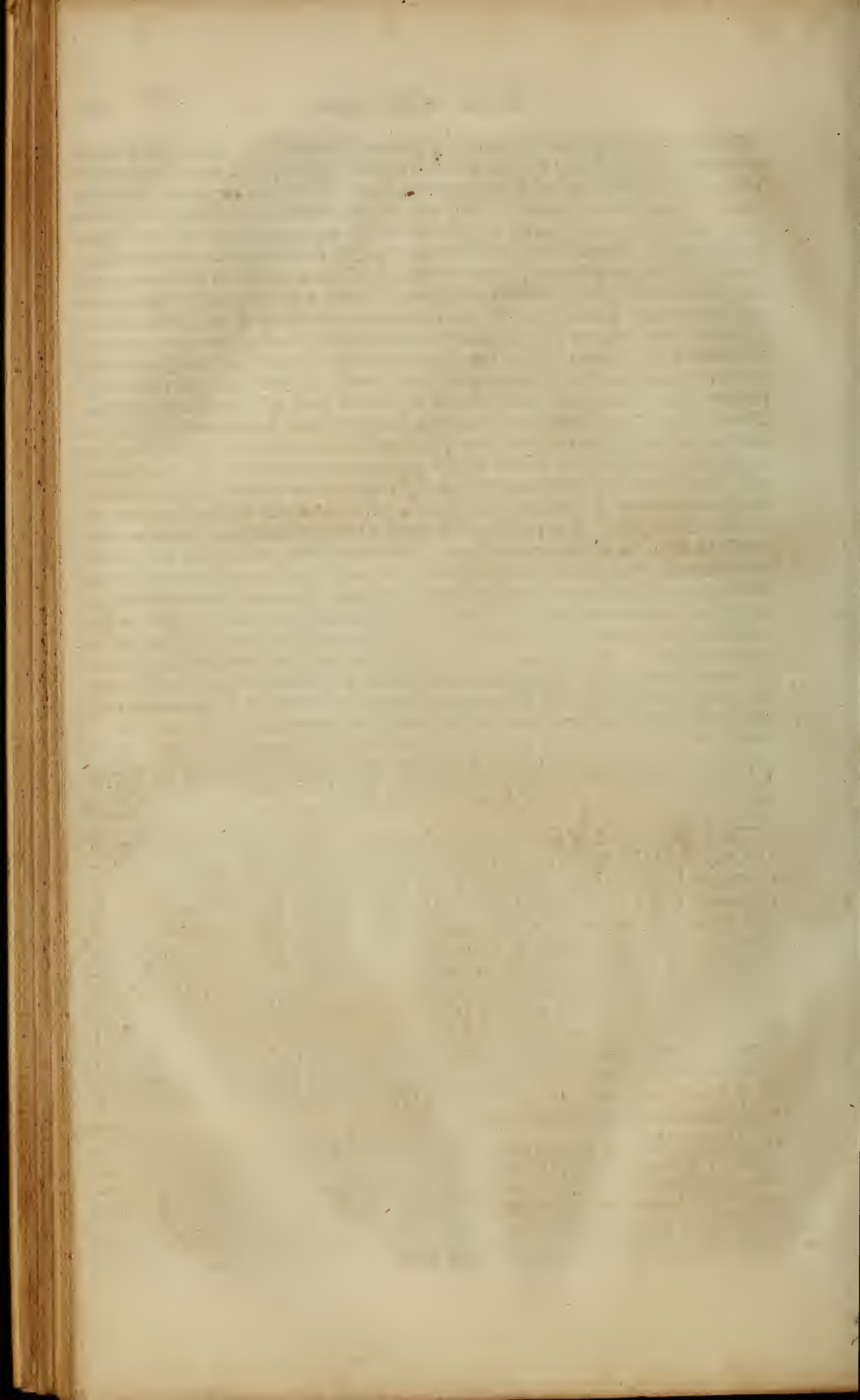
## 2. *On the Absorption of the articulating Cartilages complicated with the Effects of Friction on the Bones.*

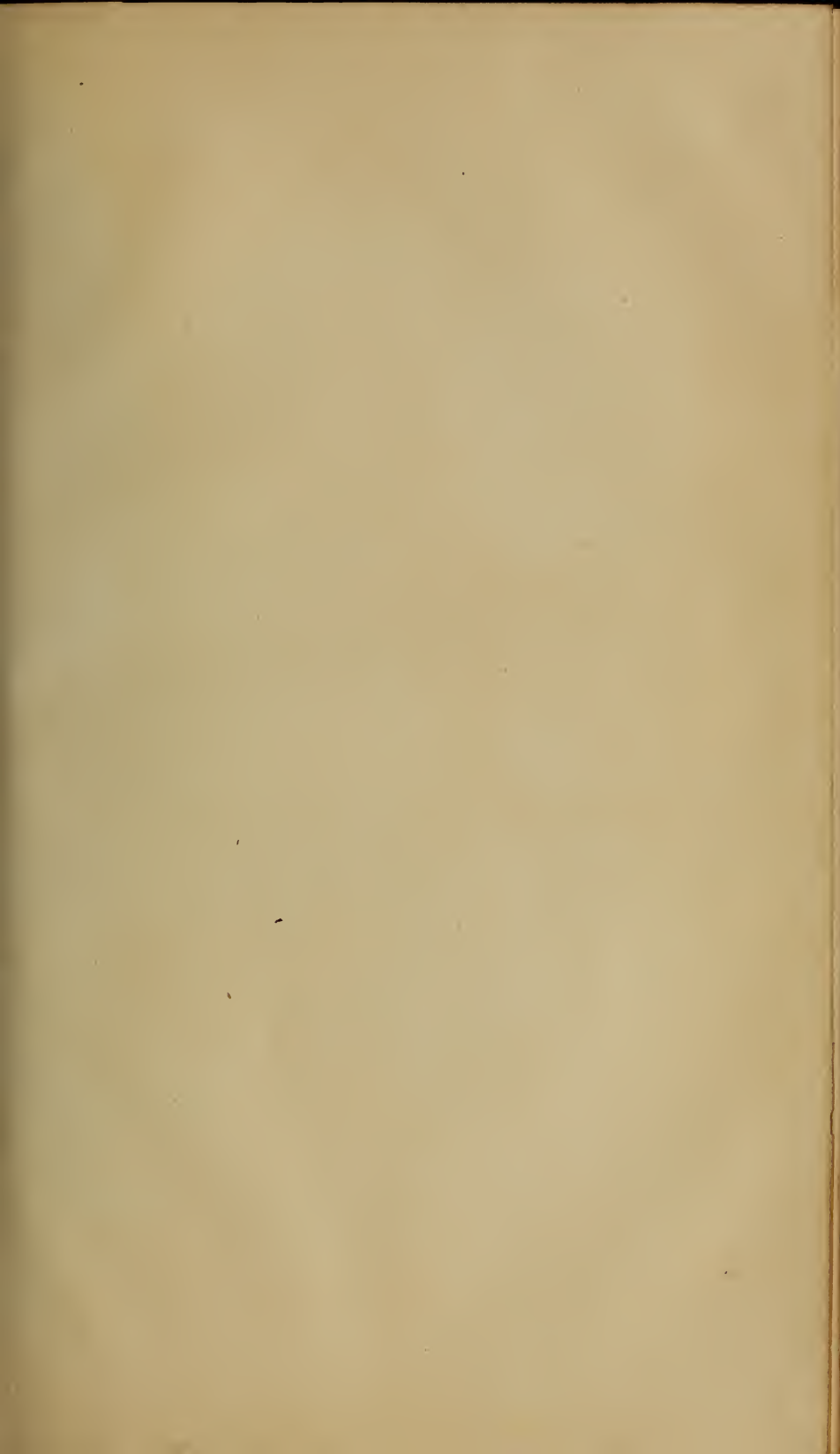
The peculiar kind of absorption of the cartilages which is described in page 119, as one of the effects of gout, occurs also in some of those cases of chronic rheumatic inflammation, which are often distinguished by the appellation of rheumatic gout; such as are described in the first chapter of this work, p. 11. The process by means of which this absorption is effected, is manifestly different from ulceration, and is altogether very remarkable. The cartilages disappear, so that the bones are exposed; but the latter present nothing corresponding to the appearance of a carious surface. They bear evident marks of having been subjected to the influence of friction, but the consequence of friction on the living, are entirely different from those of friction on the dead bone. There is no exposure of the cancellous structure; a process of growth goes on simultaneously with that of destruction; and the result is, the deposit of a hard and compact layer of bone over the cancellous structure, which would have been exposed otherwise.

vertebral cartilages, and, at other times, in a morbid condition of the cancellous structure of the bodies of the vertebræ;" and whoever will be at the pains of seeking opportunities of studying the pathology of caries of the spine by dissections made at an early period of the disease, will, if I am not much mistaken, find abundant reason to confirm the truth of the above observation.

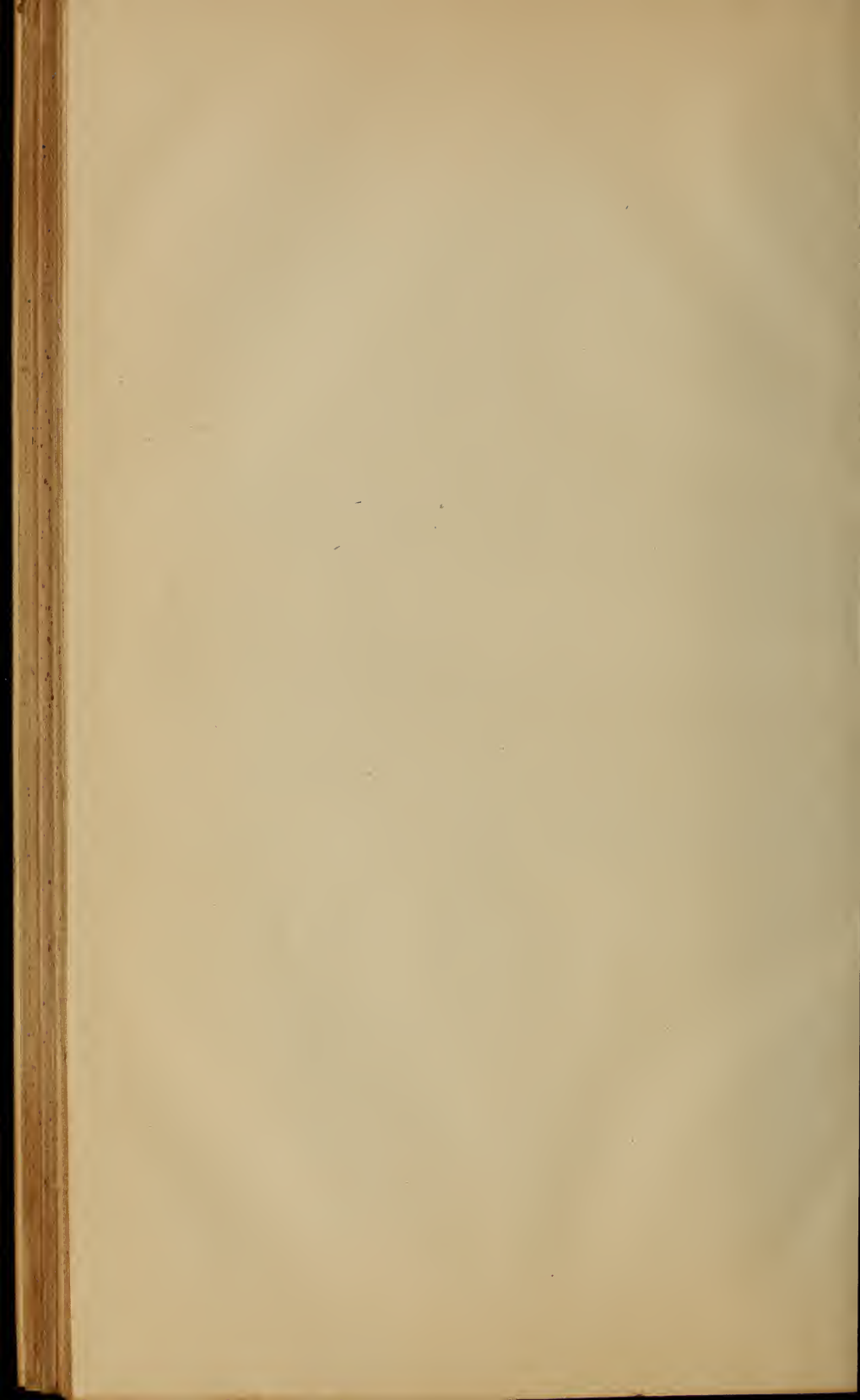
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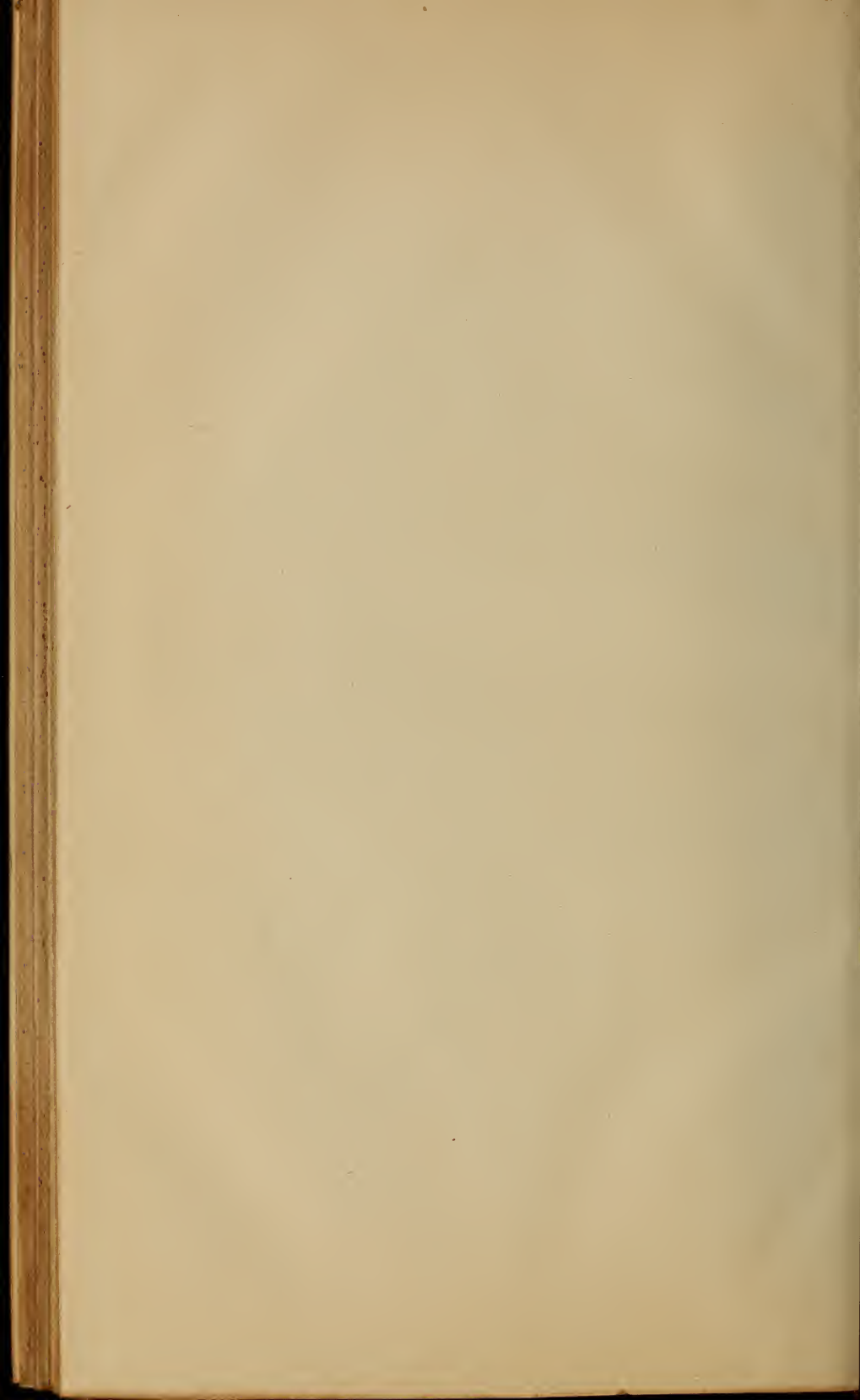










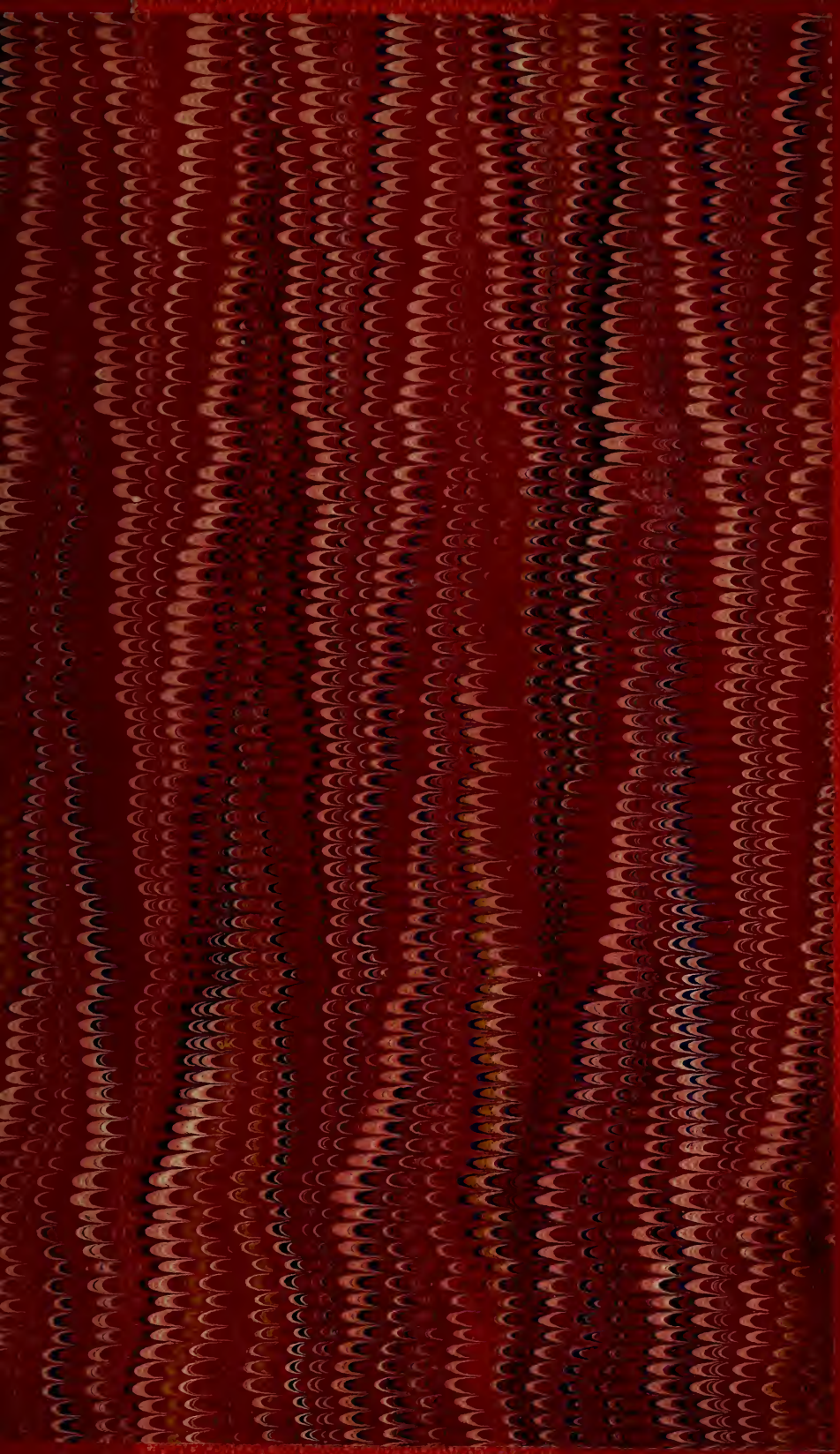


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